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CONTENTS

ORIGINAL ARTICLES

PAGE

Glycosuria During Pregnancy. Roland S. Cron, B.S., M.D. ---- 399

Syringomyelia. A Study. Charles W. Hitchcock, A.M., M.D., F.A.C.P. ---- 404

Intestinal Stasis, Its Mechanism, Eitiology and Treatment. Bruce C. Lockwood, M.D. ---- 410

The Role of the Tonsils in Pulmonary Tuberculosis. R. Bishop Canfield, M.D. ---- 415

EDITORIAL

PAGE

Membership Campaign ---- 419

Public Health Administration ---- 420

Editorial Comments ---- 422

Correspondence ---- 424

DEATHS

Dr. John Henry Carstens ---- 426

Dr. Victor Sisung ---- 427

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CONTENTS—Continued

Dr. H. B. Morse ---------- 427

Dr. L. J. Locy ---------- 427

STATE AND SOCIETY NEWS

State News Notes ---------- 427

Gratiot-Isabella-Clare ---------- 428

BOOK REVIEWS

Newer Methods of Blood and Urine Chemistry. B. H. Gradwohl, M.D., and A. J. Blavais ---- 428

Diseases of Children. John L. Morse, A.M., M.D. 428

Human Parasitology. Damaso Rivas, M.D., Ph.D. 428

Diagnosis and Treatment of Brain Injuries. William Sharpe, M.D. ---------- 428

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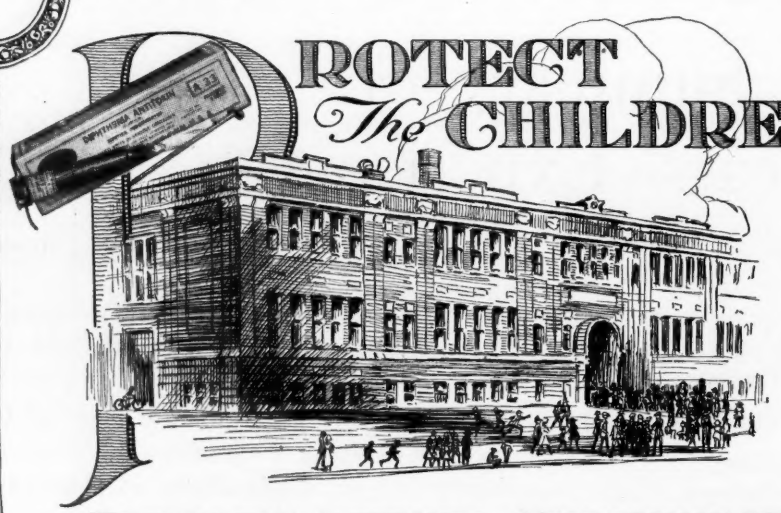

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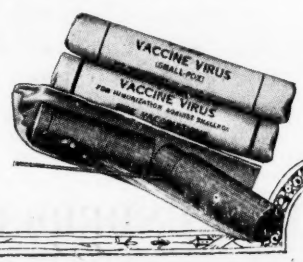

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Vol. XIX GRAND RAPIDS, MICHIGAN, SEPTEMBER, 1920 No. 9

Original Articles

GLYCOSURIA DURING PREGNANCY.*

ROLAND S. CRON, B.S., M.D.
ANN ARBOR, MICH.

J. Mathews Duncan was probably one of the first to correctly interpret the findings of glucose in the urine during pregnancy. In a paper on puerperal diabetes read before the London Obstetrical Society, he reported 22 pregnancies occurring in 16 women who had become pregnant while suffering from diabetes or had developed the disease while pregnant. Eleven, or 68 per cent. of these women died within the following two years as a result of the disease, while 47 per cent. of the children were lost. Offergeld in his monograph of 1913 reports 63 such cases with an estimated maternal mortality of 50 per cent. and a minimum fetal mortality of 66 per cent., 56 per cent. being still births and another 10 per cent. dying during the first few days of life. Joslin, however, in a recent paper has taken a much more optimistic view of the complication, although both his maternal and fetal deaths in the moderate and severe cases approach these of Duncan and Offergeld. From these statistics and those of the state of Massachusetts, which show that the frequency of diabetes has more than doubled within the past ten years, it can be seen that the disease is an important one to recognize.

In a review of 2,200 consecutive cases of the Obstetrical department at the University Hospital, where the patient's urine is examined at least once every week, I have been able to find cases of lactosuria and almost every type of glycosuria. Only the urines in which there was a definite reduction of Fehling's solution was sugar recorded by the examiner as being present. Of these 2,200 cases 88 gave a test for some form of sugar during either pregnancy, labor or the puerperium.

*Read before Section on Gynecology and Obstetrics, M.S.M.S., Annual Meeting, May, 1920, Kalamazoo, Mich.

I now wish to present from the records of the University Hospital two typical cases of diabetes mellitus and a number of conditions which may be confused with true diabetes.

Case (O. B. No. 338). The first is the case of a patient with lactosuria, who four weeks before labor and six days postpartum gave repeated tests for sugar in her urine. This was definitely proven to be due to milk sugar.

Lactosuria. There is no doubt that a certain percentage of all pregnant and puerperal women have some form of sugar in the urine. This in most cases is in the form of lactose, or milk sugar, and is due to a premature activity or engorgement of the breasts. It can be found most frequently during the puerperium when the breasts are engorged or during the weaning period, but may be present as early as the sixth month of pregnancy. In none of these uncomplicated cases has Schiller been able to demonstrate any increase in the blood sugar.

Case 2 (O. B. No. 44). The next is a case of alimentary glycosuria in a young girl, aged 20, who was in the habit of eating considerable quantities of candy. Her urine repeatedly reduced Fehling's and gave the fermentation reaction. With a restriction of the carbohydrates the urine became sugar free and remained so throughout the pregnancy and puerperium.

Ailmentary Glycosuria. It is a well recognized fact that the pregnant woman is less tolerant to carbohydrates than the non-pregnant woman. As has been demonstrated in this case by simply removing the excess of carbohydrate intake the sugar in the urine disappeared and remained absent following delivery. Norris has shown that in pregnant women there is a certain susceptibility to ailmentary glycosuria, so that an ingestion of 60 grams of glucose will produce a glycosuria.

Case 3 (O. B. No. 1163). Renal Diabetes. The next case is that of a primipara, aged 35, who gave a history of nephritis with hypertension and angiosclerosis of the retinal vessels.. Her urine reacted for glucose two weeks before delivery and her blood sugar repeatedly was found .158 per cent., the upper limit of normal. She

had at this time 2 grams of albumen per liter of urine and a blood urea of .0384 grams. Her sugar excretion was uninfluenced by diet. The labor was uneventful except that she was delivered of a macerated fetus with an accompanying infarcted placenta.

Renal Diabetes was diagnosed in this case because the blood sugar was always within the limits of normal, and her glycosuria uninfluenced by either increasing or decreasing the carbohydrate intake. The most recent work by Foster and Mann on the sugar content of the blood in these renal diabetics has proven that there is not a hyperglycemia present. It is peculiarly characteristic of pregnancy and may be due to a hypersensitiveness of the kidney to glucose or the result of a phloridzin-like substance. There may be a recurrence during successive pregnancies and occasionally the glycosuria may alternate or be combined as in the case with albuminuria.

Case 4 (O. B. No. 2144). This case is that of a patient with diabetes mellitus due to a syphilitic pancreatitis. She is a primipara, aged 19, who became pregnant in July, 1919. She entered the Maternity clinic February 7, 1920, with a diagnosis of lues and diabetes mellitus, present since December, 1919. A physical and laboratory examination corroborated the diagnosis of syphilis. A general adenitis, pigmented scars on the right labium and a positive Wassermann were found. The uterus was enlarged to the size of a six months' pregnancy and the fetal heart was heard. Chronic gonorrhea was also demonstrated.

The glycosuria and blood sugar had a tendency to drop simultaneously with the lowering of the carbohydrate intake and arsphenamine injections.

On February 2, she was delivered of a seven months' stillborn fetus which had died during labor. At this time she presented the only signs of acidosis but without any glycosuria or hyperglycemia. During the first two weeks of the puerperium the diet was unrestricted, consequently sugar appeared in the urine of the fifteenth day postpartum and the blood sugar ascended to .135 per cent. With a resumption of a low carbohyrate diet and antiluetic treatment both sugar findings returned to normal.

During the puerperium she developed a pelvic and general peritonitis, which localized as a tubo-ovarian abscess. This ruptured five weeks postpartum and eighteen hours later she died with the symptoms of peritonitis rather than those of diabetic coma.

Diabetes Melitus and Syphilis. The premature labor with a stillborn fetus may have been due to both diabetes and the syphilis. Since the placenta showed no positive signs of syphilis, and although the liquor amni contained no sugar, and there was no hyperglycemia of the fetus, nevertheless, the type of labor with a living fetus just prior to delivery suggests that the fetal death was due to diabetes.

Certainly the indications in this case were to control the diabetes by two definite lines of treatment; namely, dietary and antiluetic. The tolerance to carbohydrates being raised by the former, and the syphilitic involvement of the pancreas being limited but not necessarily repaired by the latter. The elevation of the final blood sugar can be explained by the general peritonitis and exhausted condition of the patient just before death.

In reviewing this history one might think that the puerperal fever in this case was definitely related to the ideal culture-media afforded by the glucose in the blood. Such is doubtful and can be better explained by an exacerbation of the old chronic gonorrhea from which she suffered earlier in pregnancy.

The next two cases are those of diabetes mellitus.

Case 5 (O. B. No. 1031). The first is that of a mild type in a multipara, aged 30, who was admitted to the clinic October 4, 1914. For three years she occasionally had a small amount of sugar in the urine. On admission to the clinic, examination showed that the fetus was living and that she was in her last month of pregnancy. There was a moderate edema of her ankles. The urine was examined and both albumin and glucose were demonstrated. The former disappeared the following day and did not reappear until the day of labor. The specific gravity was found to be 1054, sugar 136 grams per liter or 17 per cent. per 24 hours with acetone ++ and diacetic ++. The tolerance to carbohydrates was then determined by placing the patient first on a van Noorden diet, then adding bread, until it was found that she could utilize 200 grams per day without excreting sugar in the urine. As a result the specific gravity descended, the sugar and diacetic acid disappeared in five days, so that the only abnormality in the urine at the time of labor was a trace of acetone.

On October 29th she was delivered of a full-term living child. Two weeks later she was discharged having gone through a normal puerperium.

During the following five years she dieted moderately, and in April 1919, she again became pregnant with the reappearance of sugar in the urine and symptoms of a severe acidosis. The same treatment which had been so successfully used in the clinic in 1914 was instituted, but no improvement was noted. A curettage was then performed, but suddenly on the eleventh day postpartum she died in diabetic coma.

Case 6 (Gyn. No. 11093). This is a type of severe diabetes in a multipara, aged 40, who entered the department of Obstetrics and Gynecology January 1, 1920. In the personal history

there are a few things to be noted. In 1916, she had a generalized edema of the body followed by polydypsia, polyphagia, polyuria, nocturia and excessive foul sweating. At this time her physician diagnosed diabetes and placed her on a modified carbohyrate free diet.

According to her history she should have been entering her eighth month of gestation. A physical and pelvic examination showed the fundus of the uterus extending three fingerbreadths above the umbilicus. The fetal parts and movements could be made out, but the fetal heart was not heard.

A urine examination gave a specific gravity of 1030, acid reaction with a very high percentage of glucose and acetone but no diacetic acid or albumin. She was immediately placed on a modified green diet which contained 11 grams of carbohydrate, 90 grams of fat and 17 grams of protein, giving her 1050 calories per day. On this diet, within four days the sugar disappeared from the urine, leaving, however, very heavy tests for both acetone and diacetic acid. At this time the blood sugar was .15 per cent. She became very restless and began to vomit. Albumin water was then administered for the following three days but the vomiting did not stop, so rectal feedings of sodium bicarbonate, glucose and water every two hours, were started. The urine showed no change, the blood sugar remained within the limits of normal and on the tenth day her condition was decidedly worse. She expelled most of the rectal feedings. Albumin, hyalin and granular casts were found in the urine. Albumin water was again started by mouth. It contained 80 grams of carbohydrate in the 22 ounces administered during the 24 hours. Her tolerance for sugar evidently was greatly reduced, for the urine quickly showed a heavy precipitate with Fehlin's and acetone and diabetic were present. On the 12th food by mouth was retained as a result of receiving 217 grams of carbohydrate. This was followed by a striking improvement in her general condition, for on the following day only a trace of acetone and diacetic acid remained in the urine. On the 14th day there was no change.

The following day at 7:30 a. m. she went into labor and at 8:40 a. m. was delivered of a premature, slightly macerated, stillborn fetus by the mechanism of persistent occiput posterior, followed immediately by a prematurely separated placenta. The blood sugar of both mother and fetus were enormously elevated, and the urine contained a large amount of sugar but no diacetic acid or acetone.

Following the delivery the patient's condition seemed to improve, but during that afternoon she passed into coma and at 8:15 p. m. of the day of labor died with all the symptoms of diabetic coma.

DIABETES MELLITUS.

By almost all authorities, the complication of pregnancy in diabetes is considered much more serious than the appearance of diabetes in pregnancy. In the three of the four cases gathered from the records of the University Hospital, the diabetes antedated the period of conception. As was shown in the last reported that of pregnancy occurring in severe diabetes of four years' standing, the outcome for both mother and fetus was most disastrous. Again, after reviewing the case preceding the last, where the diabetes although very mild antedated the pregnancy, the patient, when placed on a proper diet, went through a normal pregnancy and puerperium and was delivered of a full term living fetus. Five years later, while only two months pregnant, she succumbed to a diabetic coma.

In reviewing the blood sugar determination on the cases reported one is struck by the marked variability. The reports ranged from those within the limits of normal to the enormous figure of .8 per cent. In the case of diabetes, syphilis and pregnancy the blood sugar when the patient was placed on a non-restricted diet was found to be .28 per cent. When the diet was restricted the hyperglycemia immediately fell to .21 per cent. and with the advent of antiluetic treatment and following labor a further reduction to within the limits of normal was noted. When the complication of general peritonitis developed, the blood sugar rose to .402 per cent. The last case, that of a marked diabetic, is interesting because of the fact that throughout the entire pregnancy the blood sugar remained within the upper limits of normal; but as soon as glucose was administered, the sugar preceding the onset of the coma reached the high point of .8 per cent.

Acidosis in these cases is indicated by the presence of acetone and diacetic acid in the urine as well as by the symptoms of nausea and vomiting, restlessness, irritability, rapid pulse, Kussmaul breathing and by the amount of sodium bicarbonate necessary to bring about the excretion of an alkaline urine. Acetone and usually diacetic acid can be found, whenever there is an appreciable amount of mellituria, and frequently, while the patient is on a starvation diet even after the mellituria has disappeared. Most commonly acidosis is the result of a diet high in fats, even though the carbohydrates have been reduced to a minimum. Whether the acidosis in the last case reported was due to the Van Noorden and later starvation diet, or whether it was the result of a high fat intake, is a debatable point. But I heartily agree with Joslin, Strouse, Bloor and Tice, that the most important factor in the production of acidosis is fat and secondarily carbohydrates. Hence, in the treatment of these cases the fats

should be reduced to a minimum or entirely eliminated if necessary, and the carbohydrates reduced to the point of tolerance.

Nowhere in the literature have I been able to find even a consideration of the possibility of the production of a nephritis, or exacerbation of a latent nephritis, by the feeding of such a relatively high protein diet as is indicated in the treatment of diabetes. Newburgh has shown conclusively that in animals an acute nephritis can be brought on by continuously feeding a high protein diet. The same may be true in man. At least, it is within the range of possibilities. In pregnant women we know that the most common complication is albuminuria In practically all cases this is the result of a renal destruction due to either one of the toxemias of pregnancy, or a true nephritis. It is interesting to note that in the four cases of diabetes complicating pregnancy gathered from the records of the University Hospital, in all, there were signs and symptoms of renal impairment and in the two which came to autopsy reports of some renal pathology. Why then is not diabetes and nephritis during pregnancy even more of a serious complication than is usually realized? Here we have two diseases which require absolutely different dietary treatment. The one requires a diet low in carbohydrates and fats, while the other should have a minimum of protein.

During the pregnancy the patient should be constantly under the supervision of the attending physician, and on first consultaton should be treated in accordance with one of the methods outlined by Joslin, Allen, Strouse, Beattie or Woldert. These consist either immediately placing the patient on a starvation diet as advocated by the Allen school, or instead, in using the more conservative gradual reduction of fats, proteins and carbohydrates as advised by the others. In the milder cases, as in case 5, the omission of fats, bread and sugar will usually free the urine of glucose. Then within a few weeks a tolerance of 125-150 grams of carbohydrate can be secured, after which, provided the urine remains sugar free, protein and fat sufficient to retain the normal weight of the patient can be added. These cases will usually go through an otherwise normal pregnancy and puerperium.

It is the more severe cases, such as case 6, which ought to be considered in greater detail, since the treatment in these cases is more difficult. Here the usual medical treatment combined with surgical interference if necessary must be employed. Such interference depends upon the viability of the child and also the response of the disease to medical treatment. In every case the following treatment should be observed before any other interference is considered; immediate omission of fats, gradual reduction and final omission of protein, followed by continued reduction of carbohydrates with fasting eventually if necessary. In a gradual reduction such as this, one is much less liable to coma. The urine having become sugar free, the tolerance for carbohydrates is then determined by gradually increasing the latter, until a point is reached just below that at which sugar is excreted in the urine. Next, the proteins are increased, until the patient is receiving one gram of protein per kilogram of weight, or less if the carbohydrate tolerance is low. It is advisable to start the proteins before the carbohydrate tolerance has been reached, so that the normal is approached as early as possible. Fat is to be added only after the protein tolerance has been brought up to the required amount of protein and the carbohydrate tolerance has been determined. As long as acidosis and glycosuria are present, the fat must be kept low. In every case one should attempt to feed 30 calories per kilogram of weight.

Other medical treatment of great advantage in combating the acidosis recommended especially by Sellards is alkalinization by the liberal administration of sodium bicarbonate, either by mouth, rectum or intravenously. Alcohol has been used with great benefit by Allen, Foster and Van Noorden to guard against acidosis and also to make up the required calories for sustaining life.

After having employed the treatment outlined above, one must act according to the viability or non-viability of the child. Before viability, the indications sufficient to terminate pregnancy in the most conservative manner are (1) an albuminuria, (2) inability to raise the tolerance so that the patient is receivng 30 calories per kilogram of weight (3) a persistent hyperglycemia, (4) a persistent acidosis, (5) a history of aggravation of the disease during previous pregnancies. After viability, most authorities, chief among whom are Williams, De Lee, Fruhinholz and Lesse, advise waiting with the employment of medical treatment and inducing labor only when threatening symptoms such as those mentioned above, plus hydramnion and progressive weakness appear. According to these authorities labor should be brought on by rupturing the membranes, packing the cervix, introducing a balloon or bougie and then permitting the patient to deliver herself. Recently however, De Lee, Strouse, Joslin, Caldwell and Bibb have, after preparing the patient

as for a surgical operation by reducing the hyperglycemia and through alkalinization, used Cesarean section to advantage. Of course this method of emptying the uterus should be considered only in those cases where there is a living child in good condition. The section should be performed under gas-oxygen anesthesia and by an experienced operator. The accompanying shock is probably no greater than that of labor and the exhaustion much less. It has the added advantage of sterilization of the mother at the time of delivery.

SUMMARY AND CONCLUSIONS.

1. A positive reaction with Fehling's solution during pregnancy does not necessarily indicate the existence of diabetes mellitus but is usually due to lactosuria or ailmentary glycosuria and rarely to renal diabetes.

2. Lactosuria is common during both pregnancy and the puerperium. It is entirely physiologic and must be differentiated from the various types of glycosuria.

3. A large percentage, 30-50 per cent., of pregnant women are less tolerant to glucose than non-pregnant individuals. They have no hyperglycemia and are not true diabetics.

4. Glycosuria may be due to a lowering of the renal threshold for sugar. Albuminuria and glycosuria may accompany one another or alternate without hyperglycemia.

5. Diabetes and albuminuria may accompany one another. This complication in pregnancy is an ominous one and calls for the immediate interruption of pregnancy.

6. Diabetes and syphilis may complicate pregnancy. The treatment indicated is both dietary and antiluetic.

7. Pregnancy may occur in diabetic women or diabetes may become manifest during pregnancy. Either is a serious complication. Many patients do perfectly well but a considerable percentage die in coma, collapse or succumb to some intercurrent infection or die during successive pregnancies.

8. The fetuses of diabetics, leaving out of consideration abortions and premature deliveries, are stillborn or die within a few days following birth in about 50 per cent. of the cases.

9. Fat is the most important factor in the production of acidosis. It should be reduced to a minimum or omitted entirely. Its only use is in bringing the caloric requirement of the patient up to normal.

10. If sugar appears to a slight degree in pregnant women it should be carefully controlled by diet, and unless a carbohydrate equilibrium can be maintained, pregnancy should be terminated. The advantages of Cesarean section under gas-oxygen should be kept in mind.

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DR. L. W. HAYNES, Detroit: The Doctor's paper is very interesting and it was particularly interesting to me to hear him recount the time that the glycosuria appeared. I have had several cases where the sugar was present when the women became pregnant, where by careful dieting I have been able to cure them. One case was particularly interesting. The patient was a primipara about twenty-five years of age and everything was normal in the urinalysis until about the seventh month, when there was a slight trace of albumin. She went into the hospital and a sample was taken which showed a slight trace of albumin but no sugar. She was delivered by low forceps the next day. Immediately after the delivery glycosuria appeared and was quite persistent and about the sixth or seventh day I called in Dr. Freund, who directed the feeding of the case. This woman carried glycosuria for about eight months following pregnancy. She became pregnant again about two-and-a-half years later and there was no sugar or albumin at any time during the second pregnancy. She began to lose some amniotic fluid about the eighth month. She was not syphilitic and there

had been no accident that might have ruptured the sac. However, she miscarried and following that developed no sugar.

One thing I would like to know is whether the Doctor has any cases that had any hydramnios following pregnancy? None of my cases had, but I see it frequently mentioned in the literature.

DR. HOLLISTER JUDD, Detroit: It does seem a little to bad to use starvation diet. I remember that in rheumatism they used to starve the people and in diabetes. I think the older practitioners used to cut the people down to starvation a great deal, but I think today we know so little about the body chemistry that it does not get us anywhere at all. There are so many physical findings and so much about the metabolism that we do not know, that it has given rise to experimenting too much with people's diet and cutting them down too much. I think we often do more harm than we do good. I remember when I was younger they used to tell us which was the dangerous thing and which was not, but now they seem to look upon it all as being not so safe as they used to think. I think it is safer to do a Cesarean section or empty the uterus in some other way for the woman who begins to show any kind of dangerous toxemia. Today the Cesarean section seems to be so easy, if you do it, it is so simple and quick, with, I think, a mortality of only 2 per cent., and it is better to empty the uterus when they begin to develop toxemias. On one occasion I did a Cesarean section for a dead baby and the mother did all right. I will not mention the details because I am sure you would think I did right, but I think we should always empty the uterus if they develop serious symptoms of toxemia.

DR. ROLAND S. CRON, Ann Arbor, (Closing): One of our cases may have had a slight or moderate hydramnios, but in the other it was not noticed. The fluid usually shows the test for sugar, and it may complicate the pregnancy even more than just the diabetes. You may get the other accompanying symptoms of malposition of the cord and all the things we do not wish to see.

I did not run across, anywhere in the literature, the complication of pentose sugar which was mentioned. In practically all of our cases it was definitely proven to be lactose or else glucose. I do not imagine the calculation of pentosuria means very much. It is very rare and I think the radical measures would not need to be carried out.

In regard to the diet, there seems to be no doubt in my mind about what should be done. The only treatment for diabetes is diet. You have to reduce the carbohydrates until you get the point of tolerance down to the point where the patient can take care of it. If you continue feeding fats and carbohydrates and the patients continue to excrete glucose you are destroying the pancreas. The most important treatment I can emphasize is in regard to the diet. Reduce the diet and treat the patient only with this interference, provided you cannot reach a carbohydrate equilibrium. In these patients it is not necessary to do Cesarean section. One patient went through a normal pregnancy and has had no further difficulty in five years. Those that respond to medical treatment we carry along as well as we can. The advantage of doing a Cesarean section is doubtful in a good many cases, simply because the fetal mortality is so high. The most common thing is to have a patient go into labor and have a fetus with a normal heart up to the second stage, and then deliver and get a stillborn fetus.

SYRINGOMYELIA. A STUDY.*

CHARLES W. HITCHCOCK, A.M., M.D., F.A.C.P.
DETROIT, MICH.

Surprisingly large in number and kind are the symptoms which may develop in the train of cord lesions and of these none gives rise to a more varied and interesting symptomatology than the cavity-forming disease of the cord.

Syringomyelia, first, apparently, observed by Etienne about 1546 was so named by Ollivier, who wrote in the early part of the 19th century (1824), and though written about by several anatomists (von Brunner 1688, Morgagni and Santorini 1740 et al.) from Etienne on, the condition was regarded largely as a curiosity until after 1860, when a number of writers made important contributions to the matter of its pathology.

Its most distinctive characteristic consists of a cavity formed within the cord, more commonly in the lower cervical and dorsal regions, sometimes short, involving but five or six segments, in other cases extending the entire length of the cord and even involving the medulla and pons. In some cases, two or three cavities are discerned at different levels. Usually the cavity, of any size or shape, lies near the central canal, behind the posterior commissure and may encroach largely on the posterior grey or both posterior horns, but it may occupy the place where commonly the central canal is found. Thus it may communicate with remains of the central canal or this may be pushed to one side. In its walls proliferation of glial tissue is largely in evidence.

Various theories have been propounded to account for this unusual condition and Starr speaks of five which may be condensed thus: 1. The theory of a congenital defect in cord development as the point of departure. This accounts for a hydromyelia, but some have advanced the idea that by the proliferation of glia cells, the invasion and breaking down of normal tissue, a hydromyelia may pass over in-

*Read before the Detroit Academy of Medicine and later before the Wayne County Medical Society.

to a syringomyelia. Proponents of this theory assume a close relationship and connection of the cavity with the central canal. 2. Another explanation is that the normal glial tissue (this last near the central canal), possibly from irritant or toxic influence, takes on active proliferation, invades the adjacent nervous tissues and eventually breaks down in its center, thus giving rise to a cavity formation. 3. Several workers have observed, subsequent to disease of the spinal arteries, a tendency to the formation of cavities quite independent of the central canal. Others stoutly aver that the walls of these cavities do not resemble those of true syringomyelia. 4. Van Gieson and some others have explained the cavity formation as the result of an earlier perforating hemorrhage in the cord. 5. Others have advanced the theory of bacterial infection to account for the pathological condition. Advocates of this theory would closely relate the disease to certain forms of leprosy.

Though its symptomatology may be manifold and complex as will later appear, this may be simply condensed under these heads: 1. Dissociation of sensation, a loss of the sensation of pain and temperature in any part of the body, tactile sense being preserved in the analgesic region. 2. Trophic disturbances in the skin, muscles, bones and joints, e.g. ulcers, abscesses, whitlows, cracks and fissures. 3. Atrophic and paralytic symptoms, e.g. a progressive muscular atrophy attended by paralysis. The presence of any one of these groups should arouse suspicion and the finding of any two should be fairly confirmative of the diagnosis. Extent and multiplicity of symptoms will naturally be dependent upon the size, situation and extent of the pathologic lesion.

Analytic of dissociation of sensation, the course of the sensory fibres in the cord is here pertinent. Fibres conveying pain sense enter the posterior horn and ascend from two to eight segments, in the grey matter before decussating, after which they ascend in the column of Gowers (ascending anterolateral tract), a part to the cerebrum, a part, for pain reflexes, to the cerebellum and inferior olive. Fibres conveying a sense of heat and cold take much the same course, though separate and apparently separate from each other, since some patients show a differing impairment of sense to heat and cold.

Tactile sense fibres travel upward in the posterior columns of the cord on the same side, probably decussating higher up. Sense of position comes from the joints, of motion from the muscles. Let us note first: *The Motor Disturbances*: Among the irritative symptoms are found various spontaneous movements and tonic spasms of muscles and phenomena not seldom observed as the result of motor involvment, as loss of power or rigidity in an extremity. Muscle atrophy is especially frequent in the upper extremity, for example in the ulnar group of hand and forearm and this may proceed from distal extremity to shoulder-girdle. It is rarely symmetrical. Club foot sometimes occurs. The muscles of the neck may be involved and a proliferation of a sub-cutaneous fat may hide the resulting atrophy. Sundry infiltration processes have been noted, some of them very like a myositis ossificans. Hypertrophic and pseudo-hypertrophic changes occur as also changes in electrical reaction, as a decrease of excitability to faradic and galvanic currents. Fibrillary twitchings in the atrophying muscle-bundles are noted and varying muscle and tendon changes, a crepitating tendovaginitis, Dupuytren's contracture of palmar fascia. Histological changes are found in muscle fibres and in intra-muscular vessels and nerves. Exact and sharply defined localization of affected areas is often impossible. The gait may be varyingly modified, a forward inclining (festinating), an ataxic or a staggering gait or there may be a combination of cerebellar-ataxic and spastic-paretic gaits.

Under *Sensory Disturbances*, we shall of course find much to claim our attention. The quality of perception may be changed, especially that of cold and heat perception; there may be pains, often severe and not infrequently they may be shooting in character. Lesions are most frequent in the cervical and upper dorsal cord and pains accordingly are of relatively frequent occurrence about the shoulder or as occipital neuralgiae. Sometimes the dorso-lumbar and lumbo-sacral regions are the seat of pain due to a lower situated lesion. Paraesthesiae often occur early in the disease. In a hundred reported cases, there were simple paraethesiae or pains noted at first and out of 297 cases from another observer, 34 were painful at beginning. In 36 cases, 13 had pain as an early symptom.

The resulting sensory disturbance may be with segmental limitations or it may be of the glove, sleeve, or stocking variety. The vest form has been noted or the entire back may be anaesthetic and in a few cases nearly the entire surface has been involved. There may be a sensory hemiplegia.

Laehr's investigations speak clearly for the segmental arrangement of sensory disturbances but Schlesinger has found the disturbed zones arranged like bands, like strips and twice in

spiral form. A sensory hemiplegia may occur and may arise from an existing syringomyelia in two ways: 1. From disease of the white substance involving the long sensory paths within the cord or medulla. 2. From long extending disease of the posterior horns.

Modification of tactile sensibility may occur, though in very many cases the tactile sense is intact. If a blunting occurs, it seldom advances over large areas to complete anaesthesia and its limitation is usually segmental in character. Delayed tactile sense is rare.

Pain Perception: A period of great irritability to slight irritations may precede the later development of complete analgesia, which itself may follow a gradually increasing hypalgesia. A needle has been painlessly carried in an elbow-joint. Mucous membranes may share in the anaesthesia. Muscle atrophy with or without direct relation to the sensorily involved areas, may occur and develop long after the sensory involvement. There may be merely delayed perception of pain. If we investigate the anaesthesia in detail we shall find one form arising from lesion of the long sensory tract and the other conditioned upon invasion of the grey substance.

Temperature perception may be variously impaired. There may be (1) a delay in perception or (2) an increasing failure to note temperature at certain points, a greater defect, or (3) such dissociation that heat and cold are perceived much alike or, instead of a perception of warmth, only that of touch is apparent, or (4) the perversion may be such that cold provokes sensation of warmth and heat that of cold. Thermo-anaesthesia or thermo-hypaesthesia may develop relatively early. Legends of heroic deeds with knives, furnaces, etc., are believed to have had syringo-myelias as their active characters. The mucous membranes of oesophagus, stomach, urethra, etc., may participate in this sense impairment.

.. *Impairment of deep sensibility*: Both lower extremities may show an impairment of muscle-sense or this may be of hemiplegic or monoplegic type. As to extent, duration, etc., this will depend upon the character and extent of posterior column involvement. The Romberg symptom and ataxia may be present. Pressure-sense, more rarely concerned, may be impaired. The stereognostic sense is often greatly impaired or lost and, since dependent upon two factors (a) superficial and (b) deep sensibility, may be seriously interfered with by an impairment of either. That bone-sensibility is, in cases, much affected is attested by painless, spontaneous fractures and by painless operations upon the bones. Not only the pain-sense of the bones may be lost but also the specific sensibility of the bones to tuning fork and other vibrations.

Unless it be tabes, there is no other disease so frequently illustrative of the etiological influence of the nervous system in tissue changes.

Trophic lesions of the skin are most frequent and manifold in their development and here are found cutaneous hyperaemiae, both active and passive, as also cutaneous anaemiae.. Here, too, are oedema's whose spinal origin is attested by the intact vessels, normal heart, kidneys, etc., in connection with their unusual situation, which is most frequently in the upper extremity. These oedemas of syringomyelia are peculiar in their vanishing, their intermittences and their development. Not to be confounded with these oedemas is the condition termed by Marinesco "main succulente" in which the dorsal surface of the hand is swollen, now a small area, now the whole dorsum and even the fingers. There is no pitting on pressure. This, according to Marinesco, is due to two separate processes, one, spastic, in the cutaneous cells and one a vaso-motor change of altering intensity, producing dilatation of the small arteries, capillaries, veins. The swelling arises not from mechanical causes but from nervous influence (excitation of a spinal vaso-motor center with succeeding paralysis.)

Anomalies of secretion and affections of the skin are significant and interesting. Affections of the perspiration are chiefly of three forms—an excessive secretion, a lessened or abolished function, and a paradoxical sweat reaction, when e.g. the patient sweats from the effect of cold rather than heat. In the face, the anomaly may be sharply limited to one-half and hyperidrosis is more common than anidrosis. An upper extremity may exhibit one or the other and sensibility may be simultaneously impaired. Sometimes a lower extremity is involved, sometimes half the trunk. Various inflammatory dermatoses sometimes supervene. There may be acute or chronic: angio-neuroses, vesicular and phlyctenular outbreaks of dermatitis, erythematous inflammations, phlegmonous with plastic exudate, or a condition known as gangreniform skin; cutaneous hemorrhages, hypertrophies, atrophies, benign neo-plasms, cutaneous ulcers. The nails may be changed in form or appearance—thickened, thinned or dulled.

Joint and bone affections: The joints of the upper extremity are more often involved, though much more rarely than in tabes are both sides of the body affected. From 20 to 25 per cent of cases show joint involvement. Joint affection

may be an early symptom. One observer thinks it most commonly beginning at about 40 and trauma may be its starting point. In rare cases, these troubles show coördinated symptoms, e.g. a double congenital dislocation of the hips. In contrast to tabes, too, these troubles seem to prefer the upper extremity, about 80 per cent. occurring in the upper, and 20 per cent in the lower extremities, about the reverse of tabes. The shoulder-joints and the male sex are most commonly affected. Various circumstances, e.g. the occurrence of trauma and the absence or abeyance of significant sensory or trophic changes, may direct attention to other than the underlying spinal lesion and render diagnosis difficult. In two reported cases, (Ssokolow's) of apparently purely traumatic dislocations of the shoulder, only a very careful investigation disclosed the existing syringomyelia.

The joint affections in this disease develop only rarely in the lower extremities and are more often unilateral. Their beginning is often apparently acute and marked changes in the joints may develop rather quickly, although, pain, according to Londe and Perry and in accord with the experience of Schlesinger, may long have been noted (in some cases for over a year) at the site of the later developing arthropathy. Lancinating pains and even pain crises have been observed (Brissard and trophic skin troubles, (blisters, pustules, etc. may also occur. At the start, especially in the light form, no deformity of the joint is seen, but creaking and rubbing sounds are observed, sometimes so loud as to be heard at some distance. The movements may be painless and even pressure may cause no discomfort. The supporting ligaments may become so loose as to allow considerable excursion of the affected joint. The capsule becomes stretched and extended and may rupture. Effusions do not as a rule last long and are soon absorbed, the affected joints often assuming normal aspect, though the trouble may recur on light provocation. Spontaneous luxations, more frequently of the shoulder, may occur and become habitual. Spontaneous fractures or epiphyseal separations are not unknown. Anchylosis, changes, hypertrophic and atrophic, combined or singly, suppurative processes, impairment of superficial sensation over the joint, dissociation of sensation (thermo-hypo—or anaesthesia) have all been noted and painless operations without anaesthetic have attested the loss of sensation in some of these joints, movement and manipulation being felt but pain-sense quite lost. Schlesinger cites in great detail over 80 cases of many varied changes.

Bone changes play no inconsiderable role and may be hypertrophic or atrophic, e.g. hypertrophic of fingers or toes, unusual exostoses, spontaneous fractures, most often of the forearm, frequently without the patient's knowledge and occurring during heavy lifting or other unusual exertion or even during the usual motion of walking, without consciousness of unusual motion or effort. The bone changes are similar to those occurring in tabes, and causing like accidents, sometimes involving the whole bone, in other cases only a portion of the bone exhibiting a spontaneous necrosis. Various scolioses and chest deformities naturally result from varying vertebral degenerations.

Overgrowth and atrophy of single body sections occur and these though differing materially have been confused with acromegalic conditions. Thickenings and enlargements are bilateral and proportioned in acromegaly while mutilations and deformities are frequent in syringomyelia, without regard to symmetrical occurrence.

Reflexes: The skin reflexes, commonly not obtained may be increased. The abdominal cremasteric, often involved, are absent (naturally) in anaesthetic areas. The tendon and periosteal reflexes are not seldom wanting in muscles close to an arthropathic joint and their loss has been noted in extremities the site of sensory changes yet showing no muscle atrophy. An increase in the tendon reflexes has been noted in cases in which rapid emaciation has occurred and in which the muscles have been involved en masse rather than any special muscles (resembling an amyotrophic lateral sclerosis), as also in another group in which rigidity rather than atrophy dominates the clinical picture. In the lower extremity, very often the patellar, plantar, and adductor reflexes are significantly increased. Increase of the tendon reflexes of the lower extremity is a so frequent symptom in the cervical and bulbar form that their nonappearance or their loss dims the clinical picture. Indeed the increase of tendon reflexes, particularly the knee-jerk has been so emphasized that but little attention has been paid to their lessening or loss. Yet this is not rare and may be due to (1) a combination with typical tabes, (2) disease of the lumbar cord and destruction of the reflex path by cavity formation and (3) through an accompanying meningitis.

The uropoietic system: Frequently these patients escape for years any bladder involvement but rarely such symptoms are among the earliest noted. The more usual course is the development of the bladder symptoms only with the full development of the disease and their

advent may be either sudden or gradual. Sensory disorders, here, particularly those of temperature sense have been reported and the impaired integrity of the cystic mucous membrane may lead to enormous cystic distention, this easily leading to affection of the motor powers. A simple polyuria, an albuminuria or a glycosuria may be either temporary or permanent symptoms. Rectal complications (sphincter paresis) or paralysis of the rectal musculature are more rare as also disturbances of the sexual function. These naturally occur more usually in a syringomyelia of dorso-lumbar or lumbosacral type.

Bulbar, brain and cranial nerve disturbances: Cranial nerves from the 5th to the 12th have been directly affected. Rarely the olfactory and 8th nerves are affected. Taste is sometimes involved. Lesions involving the optic nerve are observed, a small number of cases with optic atrophy. Hysterical cases should be carefully discriminated.

As regards the anomalies of the ocular muscles in syringomyelia, 3 groups are found: (1) Nystagmus or similar twitchings; (2) Ocular muscle paralysis; (3) The symptom-complex following sympathetic paralysis. Chronic inflammation of the ependyma, lesion of the aqueduct of Sylvius, injury to the vestiform body have all been separately asigned as the anatomical basis of these disturbances. The number of cases is small. Paralyses of the extrinsic muscles were found 33 times in the literature, commonly occurring in late stages. Abducens paralysis was most frequently observed. The intrinsic muscles show a considerable number of cases of impairment. Inequality of the pupils is also of relatively frequent occurrence. Sympathetic paralysis may be caused by a lesion of the upper thoracic cord.

Affection of the trigeminus, because of its frequency, deserves careful attention. Out of 200 reported cases, 17 times was this nerve affected, and out of 300 cases, 28 presented symptoms relating to the fifth nerve. Pains and paraesthesias both as to pain and temperature are common and these patients often suffer from frightful neuralgias for years without a syringomyelic condition being at all suspected. Extensive sensory paralysis may be found in the region of the trigeminus distribution. The first, second and third segments are most commonly involved in these cases and sensory defects show a segmental distribution.

Facial paralysis, not rare, if it occurs, is commonly of slow development and may happen from nuclear or direct nerve involvement. If bulbar symptoms arise they are markedly chronic in their course.

Psychic conditions are comparatively few, though some maniacal as well as depressed states have been known. Patients with trophic impairment are especially apt to be sulky, peevish, complaining little, non-communicative.

It will readily be seen that the extraordinary multiplicity of possible symptoms, its changing course and varying onset make difficult its ready division into forms and yet in certain cases, it does assume certain types as: 1. Syringomyelia with classical symptoms, which may be subdivided into (a) cervical type, (b) bulbomedullary form. 2. Syringomyelia with chiefly motor symptoms; and here are found (a) cases in which the symptoms of an amyotrophic lateral sclerosis may conceal a syringomyelia and (b) cases in which conditions of a spastic spinal paralysis are especially prominent and (c) cases of a scapulo-humeral type. 3 Forms with largely sensory symptoms: (a) hysterical sensory hemiplegia and zones simulating such forms and (b) cases of more general anaesthesia. 4. Syringomyelia with principally trophic symptoms: (a) with the symptom complex of Morvan and (b) osteo-arthritic form. 5. Tabetic Type. 6. Pachymeningitic Type. Of these the cervical type has been longest known and most studied and its early stages are quite characteristic. The patient notes an increasing weakness of one hand, the ability to hold objects is lost, tearing pains, often of extraordinary intensity, are complained of in the arms and paraesthesia of temperature occur. There may be a clearly defined atrophy of the hand muscles and trophic changes in the fingers not rarely develop. Although but a limited area, perhaps only one finger, is at first complained of, a little later tests will show sensory changes in the other hand or arm involving pain and temperature sense or both. Contracture of the fingers, "claw-hand," atrophy of forearm muscles or of deltoid may follow.

The knee-jerks are increased, ankle-clonus is often present, the reflexes in the upper extremity lost and scoliosis may later develop.

The dorso-lumbar type is no rarity, the lumbar enlargement being not infrequently the site of cavity formation. The symptoms, varying, of course, in location are similar to those mentioned above. The reflexes are highly increased before the reflex arc is broken, and the paralysis is of the spastic type, though a complete paralysis may follow in a very short time. Genital, bladder and sphincter symptoms follow.

The lumbo-sacral type includes those cases in which the lowest portion of the cord is involved

and is one of the rarer occurrences. Motor involvement and atrophy is here largely in evidence in the leg and smaller muscles of the foot, sensory changes in the perineum, genitals and lower extremity. Trophic changes may appear anywhere below the knee. Spontaneous fractures are here not rare.

In the bulbo-medullary form, bulbar symptoms dominate the clinical picture. Its occurrence is a rarity.

Its manifold symptomatology makes extensive the consideration which may be given to the differential diagnosis. Amyotrophic lateral sclerosis may be closely simulated with its progressive muscular atrophy, rigidity, with paresis and increased reflexes. Pain and sensory changes may characterize both. Unilateral symptoms and limitation of areas will speak against the one and for syringomyelia, as also will the extent of trophic lesions, sensory involvement of the skin, and lesions of the bones and joints. Asymmetrical bulbar symptoms will also be in favor of syringomyelia.

Those disease conditions which are embraced under the term, spastic spinal paraysis, present difficulties of discrimination. Paresis with rigidities, increased reflexes, and eventually contractures are among the commonest of symptoms of syringomyelia and with their development sensory and trophic symptoms may lay but little claim to attention, though a long period of observation will ultimately uncover them, and the occurrence of some muscular atrophy, bladder and rectal involvement and genital symptoms will serve to establish the diagnosis.

A possible confusion with a diffuse sclerosis of brain and cord may be averted by the sensory involvement which will speak in favor of syringomyelic conditions. Multiple sclerosis, though it may be simulated, will yet be differentiated by the sensory, trophic and other symptoms, which eventually stamp syringomyelia, and especially the extensive muscular atrophy ultimately occurring and the sensory changes. A chronic poliomyelitis will be rather distinguished by the sensory, bladder, and rectal symptoms since a progressive muscular atrophy is its own peculiar feature, and the dystrophies will be differentiated in much the same way. The more rapid onset and shorter course will remove confusion with a subacute myelitis, though there may be many symptoms in common. Tabes, with its sensory changes, bone involvement and sphincter complications may be confused for a time and present difficulties of diagnosis, but the trophic symptoms later developing will differentiate the two.

Syphilis of the cord, luetic meningo-myelitis, Friedreich's disease, intra and extra-medullary tumors, traumatic affections of the cord, combined system affections, paralysis involving the region of the brachial plexus, some polyneuritides, the neurotic form of progressive muscular atrophy, progressive bulbar paralysis, pseudobulbar paralysis, cerebral diplegia (Little's disease), leprosy, are some of the diseases which may present points of similarity which may serve to make difficult an early diagnosis yet a sufficiently long observation will usually clear away all doubt.

Commonly, diagnosis is not difficult. The dissociation of sensation, often of segmental distribution, the trophic lesions and the slow course will confirm the suspicion of syringomyelia. Out of 260 cases collected from the literature, 174 were in males and 86 in females and of these 260 cases, 221 occurred between 10 and 40, 156 between 20 and 40.

The varied course and beginnings of the many sided clinical picture have already been referred to. Most frequently, subjective impairment of sensation gradually announces the early development, especially through paraesthesiae of the temperature sense (and through pains in the extremities which are sometimes severe). This stage may last through years, with temporary intermissions until more marked sensory loss intervenes. In other cases, the sensory disturbance is more in the background and motor impairment of certain muscle-groups is markedly in evidence. In still other cases it is the trophic symptoms which will arrest the patient's attention. From here on, the further course of the disease is governed by the varying pathologic basis present. If there is larger tumor formation in the cord, with central breaking down, the formation of genuine glioma, the downward course is a rapid one. Muscle atrophy rapidly develops; from motor paresis the step is a quick one to complete paralysis, sensory irritations are greater, sensory paralyses quickly develop, bladder and rectal symptoms ensue and threatening bulbar involvment is not rare. Quite otherwise with syringomyelia without tumor development, the course here being markedly chronic, even as long as 30 or 40 years. The outlook as to life is excellent in these cases, especially when the lesion is confined to the lower cervical and upper dorsal regions, less good if the lumbar and sacral cord be involved, bladder and rectal symptoms, cystitis, pyelonephritis, here hastening the end. Prognosis is bad, too, in the event of bulbar involvement, though, in the absence of tumor formation, the course may be subacute or chronic and of long duration.

Complications with progressive paralysis, cerebral or cord lues, tabes, tumor, hydrocephalus, of course increase the gravity of prognosis and intercurrent febrile affections not seldom unfavorably affect the course of the disease. Arthropathies, spontaneous fractures, contractures, ulcerative processes call for their own special treatment. Resort to baths, etc. does not bring the disease process to a stand-still, hot baths often seeming to hasten rather than hinder its progress.

The pathological basis of this many sided affection involving anatomical changes of important structures, precludes of course the possibility of cure.

It is to be hoped that the foregoing is not too prolix a presentation of that which, though rare, is yet a most interesting disease, remarkable for its multiform symptomatology and possibilities.

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INTESTINAL STASIS: ITS MECHANISM, ETIOLOGY, AND TREATMENT.

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The great number of people suffering from constipation and other disorders of the large intestine, together with the enormous amount of cathartic consumed per day, convinces me that there is a lack of knowledge among the people regarding the function and management of their intestines. Furthermore, from talks with physicians and with patients regarding advice from previous physicians, it is apparent that the medical profession in general is not far second in knowledge or either has no interest in the proper management of this portion of their pateint's anatomy.

PHYSIOLOGY OF THE INTESTINES.

The gastro-intestinal tract may be considered as a muscular tube endowed with a normal muscular tone, rhymicity and irritability. It is essentially an automatic organ, like the heart. Its stimuli to movement arise within itself, but these movements are regulated by the action of the extrinsic nerve fibres, so as to adopt them to varying conditions. Its nerve supply from without comes from two sources: 1. the vagus, stimulation of which causes contraction and 2. the sympathetic, stimulation of which causes inhibition of gastro-intestinal movement. Its contents move from regions of high to regions of lower tone, rhythmicity and irritability.

Bayliss and Starling (1) formulated the "Law of the Intestines" or Myenteric reflex, which states that "excitation of any point of the gut excites contractions above and inhibition below." Cannon (2), however, has shown that this myenteric reflex and peristalsis are not the same thing, and that the reflex is not always in control of the bowel and does not govern the rhthmic contractions, peristalsis or antiperistalsis which are dependent on the tonus of the canal. Alvarez (3) has also shown with his enterographs that relaxation rarely occurs before an oncoming peristaltic wave while "on the contrary powerful contractions occur which serve to stop the rush from going too far." This must be so else food would not remain in the gastro-intestinal canal long enough for digestion and absorption to take place.

Cannon (4) from roentgen observation on the large intestine of cats, divides the large intestine into two parts. The first includes the ascending and transverse colon where the most frequent movement is anti-peristalsis, which serves to keep the fluid intestinal contents in the caecum for more complete absorption of food and water. The second portion includes the descending colon where food is moved only towards the rectum by the peristaltic waves.

Material does not move along the canal unless the pressure is greater on one side than on the other. (Cannon.)

The presence of food or an irritating lesion in any part of the tract tends to raise the tone and irritability of that point. Hess (5) has shown and this has been confirmed by Alvarez (3) that the normal tonus and irritability is higher in the upper portion of the canal and diminishes as one goes down until the rectum is reached, when the tonus is relatively high again. This was shown by measuring the pull (due to peristalis exerted on small balloons placed in different portions of the intestine and having a string attached to them which went up and out of a gastric fistula. The ilium was shown to be sluggish compared to the jejunum. Alvarez believes the steepness of the gradient of forces varies with different people and at different times.

It has been shown that by stimulating either end of a loop of intestine that waves could be caused to go in the opposite direction, i.e., up or down and that by stimulating the center of the loop that waves would go in both directions(2)

Clinically numerous instances of this reverse transport of intestinal contents could be cited.

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Regurgitation of duodenal contents into the stomach is now considered a common thing.

A barium enema is often seen to be carried high into the ilium, and reverse peristalsis is observed with the X-ray. Hemmeter (5) cites experiments in which charcoal, sawdust, etc., was injected into the rectum of rabbits, guinea pigs, and rats and was found 6 hours later all along the small intestine and even in the stomach. Also that food injected into the rectum appears hours, sometimes days after from an intestinal fistula.

Alvarez by instrumental methods detects small reverse peristaltic movement in the intestine which could not be seen by the eye.

Rehfus (6) found the colon bacillus in nearly 80 per cent. of his duodenal cultures in pathological cases and attributes many cases of gastro-duodeno-enteritis with or without disease of the biliary passage to this "mild reverse peristalsis" of Alvarez. Rehfus says, "the more I see of gall bladder disturbances and also trouble with the gall ducts, the more I am impressed with the primary importance of the bowel." On the basis of this reverse peristalis Alvarez explains vomiting, regurgitation, nausea, heart burn, coated tongue, etc.

Keith (7) believes that impulse conduction in the intestinal canal resides to a great extent in certain neuro muscular cells situated between Auerbach's myenteric plexus and the muscle fibers of the intestine. These cells partake of the character of both nerve and muscle and he calls it nodal tissue because of its similarity to nodal tissue in the heart. He finds this tissue plentiful in the region of the sphincters of the digestive canal and at certain other places, and suggests that nodal aggregation serves as a pace maker for peristalsis in the zone distal to it. He believes that the effect of disordered conduction is not limited to the related sphincter, but extends to the segment beyond and that disturbance of ryhthm in one zone tends to disturb the rythm in other zones.

If Keith's work is correct which must be confirmed and studied, we have a good reason for disordered action of the bowel, just as we have in heart block and the arythemias of the heart. If oedemia, inflammation, or degenerations occur in the neuro-muscular tissue one would expect corresponding irregularities of peristalsis, either temporary or permanent, according to the extent of the lesion, furthermore one would expect the vagus and sympathetic systems to exert their influence as occurs with the heart. That the vago-sympathetic does exert much influence on the working of the gastro-intestinal tract is without question.

Intestinal stasis is often considered to be mechanical in nature i.e. due to various bands, kinks, folds, adhesions, etc., (Lane). These can often be demonstrated but at the same time the stool can be shown to pass them without trouble.

Iliocecal valve incompetency was considered a cause but now I believe is taken to be a result of a distended caecum.

The large intestine is a tube which varies in position in different individuals depending much on the patient's build, the presence of an asthenic habitus, etc., its function is everything and its position of little importance.

With the Roentgen ray (8) several types of movements in the colon are seen. The haustral markings are due to contractions of the circular fibers on the longitudinal bands, which are shorter, producing the formation of saculations. Mass movements occur several times per day usually associated with the taking of food, emotional causes, etc. When this occurs the bowel looses its haustral markings and the stool is formed into a sausage shaped mass which is pushed along around the flexures for 8-12 inches. With a sensitive colon this is accompanied by colicy pains. Reverse peristalsis is often seen extending from a tonus or constriction ring, in the transverse colon near the heptic flexure, passing backward towards the caecum. These shallow waves serve to cause a greater retention of semi-solid fecal contents for the absorption of water and food.

A disturbance in function is shown at first by an exaggeration of these reverse waves, with spasm in the proximal portion of the transverse. This causes greater retention in the cecum, distention, atony, and regurgitation into the ilium. There is also greater drying out of the feces which are formed into hard scybala, which causes irritation and keeps the vicious circle in operation.

Later the transverse colon assumes the same disturbed function and gives rise to the typical spastic colon, with loss of haustral markings.

The etiology of these spastic conditions can often be associated with a general state of hyper-tonicity, neurosis, hyperthyroidism, or with a reflex from a diseased appendix or pelvic organs. The same is true from a distended rectum due to unheeded calls to defication, obstruction from a retro-verted uterus, a rectocele, or a spastic rectum from hemorrhoids, or a fissure. Cathartics by virtue of their irritation may start and so keep the whole disorder going. A later stage is a mucus or ulcerative colitis.

Regarding the comparative frequency of

spastic and atonic conditions of the large bowel as observed by the Roentgen ray, Carman and Miller (9) state that in their experience the spastic is less often observed. It must not be forgotten however, that the opaque enema is a very soothing application and that slight or moderate spasms and reverse peristalsis may be present only at times of irritation and absent at the time of examination. Case (10) however, believes that spastic conditions of the colon are most common.

Eggleston (11) believes that the colon is spastic in most cases of constipation and that the dilated caecum is secondary, due to back pressure.

From a clinical standpoint it is certainly true that most constipated patients give a history of marble sized balls or scybala, with or without mucus. It is hard to conceive of these scybala being formed by an atonic bowel, but must be pressed together by firm and continued contraction. Stools small in diameter or ribbon shaped are due to a spastic sigmoid or rectum.

THE QUESTION OF INTESTINAL AUTO-INTOXICATION.

Auto-intoxication is a term widely used and little understood, and often is a cloak for ignorance. About all the symptoms that man is heir too, has been laid at its door, chiefly due to the teachings of Bouchard, Metchnikoff and Lane, and their supporters. The advertising concerns for various cathartics, liquid petrolatum, agar, bran, lactic acid bacilli, and patented rectal syringes have been quick to do their part in disseminating these ideas among not only the medical profession but chiefly among the layman.

Let me say at the start that there is no real scientific evidence to support the theory of auto-intoxication, and that the supposition is a clinical one and better explained on an infectious, a nervous or an anaphalictic basis.

Wooley (12) has given an excellent critical review of the subject. It has not been shown that absorption of toxic protein split products from a healthy bowel will produce symptoms of disease. These toxic protein split bodies are rendered non-toxic before they reach the blood. He states that under abnormal circumstances proteins fed to animals may be recovered from the blood and urine but with a normal bowel these experiments were not confirmed. Another possibility of toxemia lies in the absorpton of products of abnormal bacteral growth, such substances belong to the ptomain group such as cadavern, putrescin, etc., or to the aromatic series such as indol, skatol and tryosin recently the aldehydes and histomine have been mentioned in this connection. These substances are toxic, but it has not been proved that they reach the interior of the body in amount to be poisonous. Herter has shown that indol might be toxic, but Wooley and Newburgh have also shown that the body is able to take care of much larger amounts of these substances than are produced. Indican or phenol combinations in the urine do not show that they are acting as poisons in the body but that the contents of the large intestine are not in a healthy condition. Metchnikoff showed that by means of feeding certain organisms (B.bulgaricus) the bacterial flora of the intestines can be changed but Kendall, Schmidt, Torry and others have shown that the same may be done by diet alone.

Another possibility of toxaemia lies in the presence of bacteria themselves in the blood stream secondary to focal infections in the intestinal wall or mesenteric lymph nodes just as such infections lie in the tonsils, teeth, gall bladder, prostate, etc.

Wooley obtained a pure culture of B.lactic aerogenes from a duodenal mesenteric lymph node.

Under conditions of poor health infection lying in various foci is able to invade the blood stream, but with improvement in the general condition the blood becomes sterile.

Chronic infection of the crypts of the rectum are known to be of not uncommon occurence.

With chronic intestinal stasis lesions of the intestinal wall are often produced, varying from localized catarrhal areas to an extensive colitis or to localized or extensive ulceration. Wooley states that an intestinal wall which is the seat of such inflammations is more permeable to bacteria than a normal one, and that bacteria and toxic materials may pass into circulation.

Associated with these conditions of the large intestine one very frequently finds much evidence of infection in the mouth, throat or accessory sinuses. Many nose and throat men would have us believe that these infections are the only cause and that their removal along with a turbinate, etc., will cure all stomach and intestinal disorders. Such is not the case as evidenced by the numerous patients who consult us after having gone the round of tooth extraction, tonsillectomy and nose repair. Such foci may in many cases be primary but the infection has since been transported and produced other foci. In other words while it is wise to clean out all evidence of foci of infection in the head, these patients do not recover without

treatment directed to their intestine and nervous system as well.

Smithies (13) states that examination of the large bowel in chronic constipation often shows damage to the epithelial and muscular coats from actual invasion by bacteria, resulting often in inflammatory peritoneal bands or adhesions, patches of intestinal wall myosites or the actual scars of repair in the muscle layer. This has its effect upon both the motor and secretory function of the gut.

Alvarez (3) believes that all the symptoms ascribed to stasis and intoxication are the nervous ones, i.e. that constipation is generally due to nervousness and that in these sensitive people the brain is influenced by impulses arriving from a distended, over-acting or wrongly acting bowel. He bases his opinion to a great extent on the fact that in some people all these symptoms may be produced by a rectal tampon and that relief of symptoms is often obtained almost immediately after a bowel movement, too soon to be accounted for by an actual poisoning. In my experience such sudden relief is the exception and not the rule. However, it is certainly true that most constipated people are neurotic, over worked or worrying.

ETIOLOGY AND CLASSIFICATION

Having considered the normal and pathological physiology of the intestine it is easier to understand the etiologic factors, symptomatology and treatment involved. One can see that it is not possible to make any strict classification of these conditions, but can only say, and I wish to propose the name, a *Disordered Action of the Bowel,* manifested by stasis, diarrhea, mucus, pus, pain or whatever happens to be present, and indicating to some extent the state or severity of the disorder.

Formerly constipation cases were divided into the atonic and spastic forms, but this is not borne out clinically, as both may be present in the same case, or a constipation today may be a diarrhea tomorrow and then designated a colitis.

The symptoms arising are motor and when the normal progress of food is disturbed. As suggested by Alvarez this may come in four ways: 1. A stoppage. 2. A slowing. 3. A speeding, and 4. A reversal of the current. These alterations may come from, 1. Influences in the lumen of the bowel, mechanical or chemical, 2. Disease in the bowel wall, inflammatory, irritations, ulcers, etc., or actual obstruction from tumors, bands, a rectocele, etc., and 3. Afferant nerve influences.

From an etiologic standpoint patients with chronic disordered action of the bowel may be divided in five big groups: 1. Dietetic and Cathartic. We have considered how the contents of the canal are forced along by the peristaltic waves and that these contents furnish the stimulus to peristaltic action. The food of today furnishes the stool for the 3rd or 4th day. On a small residue diet this may be 5 days while on a large residue diet it may be shortened to 2 days. Stools may be easily marked off by administering a dose of charcoal or carmine.

Civilization has changed our habits of eating since our ailmentary tract was formed. We eat a white bread from which the normal cellulose has been carefully removed. We live in cities where fresh vegetables are scarce and costly. We eat hurriedly of non-residue containing food, because it is easier and quicker to get and eat.

In spite of this the average person feels that he should have a good bowel movement every day. He doesn't, so he takes a cathartic, the advertisement of which he has probably seen in the paper or on a billboard. The result is a good watery movement and he feels better. The next day he has no stool because the colon has not yet had time to fill, so on the 2nd or 3rd day he takes another cathartic and so on until the cathartic habit is established.

Most cathartics are irritating and produce a watering of the membrane of the bowel just as they would produce a watering of the eye were they applied to that mucus membrane. Continuous application of these irritants produces a catarrhal condition of the bowel with mucus, accompanied by a disordered action, manifestd by spasm or reversed peristalsis to protect itself from the oncoming irritant.

2. The second most common group of constipated people are the neurotics, here the whipple tree action of the vagus and sympathetic is upset and we get various manisfestations of intestinal disorder. To treat these people without making an attempt to uncover their apprehension and straighten out their conflicts in life is a mistake. The effects of emotions, anger, fear, disgust, etc., upon the motor functions of the gastro-intestinal tract has been amply demonstrated both clinically and in the laboratory.

3. This group includes those bowel disorders arising reflexly from disease in other portions of the body such as pelvic inflammatory disease, chronic appendicitis, gall bladder, gastric ulcer, etc.

4. This group is rather common and includes the general asthenia group (asthenia universalis) manifested by ptotic abdominal

organs, drop form heart, long thorax, and abdomen, floating tenth rib, etc., together with autonomic nervous system disturbance. Here also would come the congenital malformations of extra long and redundant colons, and the acquired ptoses from a stretched out sagging abdomen following repeated pregnancies. These people have more or less gastric disturbances and soon fall into the dietetic cathartic group.

It might be argued that many of these people have an actual partial bowel obstruction, and need short circuiting operations, their kinks straightened out, and bands, etc., removed, but this is not borne out clinically as they generally respond to accurate bowel management. It is true that many have more difficulty in getting their intestinal contents along towards the rectum. They have a weak spot in their anatomy which may have to be favored for years, or all their life, just as a broken leg may partially incapacitate that member for a long time. However, the longer their bowel is working right, the nearer they are to recovery and the more liberties may be taken in their diet.

5. The fifth group is more rare and includes cases of actual organic obstruction such as tumor masses either in the bowel or pressing on it from without. Here also one would include rectocele and hernia where the bowel pushes out through the abdominal wall or vagina and produces a blind pouch, against which the normal movements cannot act. Hypertrophy of the rectal valves may also cause actual partial obstruction.

It must not be assumed that this grouping is always distinct, as most cases come under more than one group, and practically every case ends with a cathartic habit. It is rarely that a patient consults us while cathartics are still efficient, or before they have bowel pain or distress.

DIAGNOSIS.

It is apparent that a thorough history and physical examination must be done to determine the cause, results and stage of the disease.

The most important point I am making, and one which seems to be often overlooked, is that spasmodic and perverted bowel contractions are frequent and produce distress or pain in any portion of the abdomen and often are diagnosed gall stones, peptic ulcer, chronic appendicitis or cancer. In fact we not infrequently see these patients after they have had one or more operations for these conditions.

Abnormal abdominal sensations often come immediately after eating due to pressure of a distended stomach on a sore transverse colon. Again they come several hours p.c. when the food first hits the caecum. Again they come one, two, or three days later when a particularly indigestible or irritating mass reaches a diseased portion of the large bowel. Often they are associated with a cathartic and are relieved after a bowel movement. Generally a bowel movement influences this condition in one way or another. The same is true of a large enema. The average colon holds about 10 pints and we often give a test enema up to 8 pints and watch the results, as manifested by producing or relieving the patient's usual distress or pain. Bastedo's test of inflating the large bowel with air acts in a similar manner.

Examination of the stool is a much neglected procedure. In 1915 I called attention to this and gave a short treatise on the essentials of stool examination. (14) The form, consistency and color should be noted and food remnants and pathological constituents looked for. The macroscopic observation is fully as valuable as the microscopic. Mucus may appear with any irritation, but if here are many pus cells incorporated in it there is probably ulceration present. Mucus and pus from high in the bowel is often overlooked because digestion of it occurs as it proceeds in the bowel. A cathartic will often increase it. Blood indicates ulceration or haemorrhoids.

TREATMENT.

With the foregoing knowledge in mind the treatment of Disordered Action of the Bowel becomes very simple if too great damage has not been done.

First remove all organic hinderances, if such are present, to the onward propulsion of the stool, as far as possible, either by conservative surgery or abdominal support when needed. Then adjust the diet according to the condition present in the colon. It has been brought out that most constipated bowels are suffering from over rather than under stimulation and irritation. The principle of treatment is as follows: Absolute rest until all evidence of perverted peristalsis, disordered action and irritation are gone, then gradually work the cellulose content of the diet up, being careful to avoid irritating articles, gradually giving the bowel more of a soft mass to kneed and work on, much as one would allow a convalescent from a long illness to get out of bed and gradually get back to work. Sippy (15) uses this method and obtains excellent results.

At the beginning of treatment it is well to see that all hard scybalous masses, and irritat-

ing material are out of the bowel by giving a mild cathartic or 2-4 high non-irritating enemas.

With a severe or moderately severe bowel disorder, the patient should go to bed with heat applied to the abdomen for pain or distress. The diet then is restricted to boiled milk and oatmeal gruel, later adding, soft eggs, custard, toast, crackers, rice, cream of wheat, bread and butter, cream soups and well cooked oatmeal. Then in about one week, depending on the case, the residue leaving non-irritating foods are added. First more well cooked oatmeal, then mashed potatoes one or two times per day. Potatoes are valuable because they are palpable, rich in food value, soothing to an irritable bowel and leave about 25 per cent of their original bulk in stool. Then the white is changed to rye or graham bread. Next vegetables are added, first spinach in gradually increasing amounts, one, two or three times per day, then cautiously carrots, parsnips, squash, cauliflower, Brussel sprouts and turnips. These vegetables produce a stool nearly equivalent to the amount taken. Spinach is the least irritating and the most soothing. Cabbage leaves a big bulk, but is too irritating. Later cooked fruits are added as prunes, figs, peaches, marmalades and apple sauce.

Bran leaves a good bulk but as such is too scrapy. Rolled wheat containing the natural bran is excellent to produce bulk. A happy medium between bulk and too much irritation must be maintained. Fruits in general leave a bulk equivalent to about 25 per cent. of the amount taken but in addition to this they are irritating like a cathartic, so are contra-indicated if there is a tendency to pain or distress.

No cathartics are given; for temporary relief from constipation a 3-4 oz. enema of olive oil or any good cooking oil is given at bedtime when there has been no stool that day or the stool was very hard, and if no bowel movement occurs before 10 a. m. the next day, a 1 pint warm tap water enema is given. At the beginning of treatment these oil enemas are not given until faeces can be felt in the rectum.

A glass of warm water is given before breakfast, two between each meal and one at bedtime, making six glasses or three pints per day. When the bowel movements have become normal and a gain in weight is desired, a glass of 20 per cent cream is given at each meal and 1 hour before bedtime together with 3-4 eggs daily.

The patient is instructed to avoid ice cold drinks, beer, buttermilk, lemonade, cider, fruits and fruit juices, honey, excessive sweets, cabbage and sauerkraut, also cold taking and chilling.

For medication the usual remedies for coating over the bowel are given, a combination of calc carbonate, calc phosphate, and bismuth subnitrate 20 grs. of each three times daily between feedings, serves the purpose in most cases, and helps to hasten the disappearance of irritative symptoms.

Let it not be forgotten that constipation is often but a symptom of a psycho-neurosis, a hyperthyroidism or other internal secretory disorders, and treatment should also be directed at these causitive factors.

Encouragement is all important in the neurotic and if the patient cannot be made to fit into his present environment, the latter should be changed to fit the patient. "Treat the patient himself," and as Patrich (16) remarks "may we add to the sum total of human health, happiness and progress."

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THE ROLE OF THE TONSILS IN PULMONARY TUBERCULOSIS.

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In the last decade the attention of the general medical practitioner has been directed to-

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ward the important problem of the relationship of focal infection to systemic disease. His interest in this phase of medicine has been due largely to the efforts of the laryngologists, who as pioneers in this work in the early nineties emphasized the importance of pharyngeal lymphoid disease and demonstrated the real significance of the tonsils as portals of entrance for infection. While the individual worker basing his conclusions alone upon clinical observations failed at first to excite the interest of the general practitioner, the clinician in cooperation with the bacteriologist has within the past few years produced sufficient scientific facts in the study of focal infection to place before the medical world a very important factor in medicine.

That primary tonsillar infection is often responsible for the dissemination of organisms with the production of systemic disease is no longer a disputed fact. The excellent work of D. J. Davis in an investigation of 45 cases of rheumatism proving that the deep tonsillar crypts harbored pure or nearly pure cultures of streptococcus which when injected into rabbits in small doses produced an arthritis is only one of many convincing experiments substantiating this claim. While we turn with ease to an abundance of medical literature treating at length the subject of focal infection and containing a wealth of experimental work on the effects of many pathogenic organisms found within the tonsils, we find with difficulty only an occasional treatise on the subject of primary tonsillar tuberculosis.

That primary infection of the tonsils with the tubercle bacillus does occur is an established pathological fact. We are therefore prompted to ask the question, "What is the future behavior of this organism once it has established itself within the tonsillar tissue?"

While the data herein contained based chiefly on clinical observation fails to answer this question, it serves the purpose of suggesting a possible explanation for the frequent association of tonsillar and pulmonary tuberculosis.

In the routine pathological analysis of 8,600 tonsillectomies examined by Dr. Warthin and Dr. Weller, to whom I am indebted for the statistics herein compiled, about 2 per cent. were found to be tuberculous. Prior to the year 1916 the total per cent. was four. This striking decrease in the past four years can be attributed to two factors, first that previous to 1916 the department of Octolaryngology admitted many children from the various State Institutions in whom the occurrence of glandular tuberculosis was exceedingly common and second, that during the past four years the proportion of elderly patients operated has greatly increased owing to the increasing popularity of the tonsillectomy as a therapeutic measure in neuritic and arthritic conditions, while the incidents of tonsillar tuberculosis in childhood is much greater than that in late adult life.

Crow from a study of 1,000 tonsillectomies at John's Hopkins University found 7.9 per cent. tuberculous in colored and 3.5 to 4 per cent. in white patients. Other observers have reported 6 and even 8 per cent. From the combined statistics of many pathologists the average incidence of tuberculosis of the faucial tonsils might be estimated at about 4 per cent.

What proportion of tonsillar tuberculosis represents a primary infection with the tubercle bacillus and what per cent. becomes secondarily involved from some other quarter, still remains a much disputed question. The laryngologist from a clinical standpoint considers the former a latent type with no demonstrable surface lesions and without local signs or symptoms, while secondary tuberculosis is looked upon as a manifest form characterized by the presence of a tuberculoma without ulceration or of single or multiple surface ulcerations presenting the distinguishing features of the mucous membrane lesion. In the study of 200 cases of tuberculous tonsils only four presented clinical manifestations of the disease. In each one of the four cases there was present an extensive pulmonary involvement with a definite history that the lung affection long antidated the invasion of the throat. Undoubted cases of primary tonsillar tuberculosis with surface lesions have been reported but they appear to be exceedingly rare. While the latent type may be either the result of primary or secondary infection, it seems correct to assume that the manifest form is in the vast majority of cases an evidence of hemotogenous or lymphogenous metastisis or direct inoculation from some other focus in the body.

Returning to my original question, referable to the future behavior of the tubercle bacillus

once it has entered the tonsillar tissue, the answer involves a discussion of the modes of dissemination and the effect of the organism upon distant parts. That the germ may enter the blood stream and secondarily invade remote tissues is a claim made and supported by many. The frequent occurrence of bone, joint, and skin tuberculosis could scarcely be accounted for in any way other than the result of hematogenous metastasis whether the portal of entrance be the pharyngeal lymphoid tissue, the respiratory system or the diagestive tract. In this connection the following case is of interest:

A male, age 38, was referred by Dr. Wile for nose and throat examination. He gave a history of a recent sore throat followed by the sudden appearance of an eruption which covered the entire surface of the body. There were no other complaints. His general health was excellent, his appetite was good and he had maintained his normal weight during the recent illness. The skin lesion was diagnosed by Dr. Wile as diffuse tuberculides covering the entire surface of the body. Careful clinical and X-ray examination failed to demonstrate a lesion elsewhere. Examination of the throat showed the tonsils to be markedly hypertrophied with numerous deep cryptis filled with a caseous material. A tonsillectomy was performed and the pathologist reported a diffuse active miliary tuberculosis of the tonsils. It was of interest to note that 24 hours following operation rapid involution of the skin lesions began and four weeks later there was not a trace of the skin disease to be found. Six months has now elapsed since operation and the patient has remained perfectly well.

The wide spread distribution of tuberculous lesions in the skin must necessarily be explained on the basis of hematogenous metastasis. That the preceding case represents a purely primary tonsillar infection is difficult of proof. Nevertheless in the light of the following evidence, namely; an acute miliary tuberculosis of the tonsils with a complicating skin involvement, the failure to demonstrate a focus elsewhere in the body and the striking therapeutic effect of the tonsillectomy we might correctly assume the tonsils to be the primary source.

It is with the second mode of dissemination, namely, lymphogenous tuberculous metastasis that my subject is chiefly concerned. The frequent occurrence of tonsillar and glandular tuberculosis with pulmonary apical involvement has often led to the suspicion, there might exist some direct lymphatic path from tonsil to lung. It has been generally admitted that the tubercle bacillus may pass thru the tonsils, thence thru the lymphatics of the deep cervical shain, on into the thorax to the hilus of the lung where it is finally distributed thru the visceral pulmonary lymphatics. If we assume this theory to be correct, how can we account for the frequency of apical lesions. It doesn't seem rational to assume that the organism entering the visceral lymphatics at the hilus and enjoying the freedom of dissemination in all directions would choose the extreme apex of the lung in preference to the parenchyma surrounding its portal of entrance. In other words, if this is the correct theory, why is the apical lesion so commonly found as the first evidence of pulmonary tuberculosis. With this subject in mind and attempting to find an explanation the Department of Roentgenology has recently made an interesting discovery and one that promises to be an aid in substantiating the theory of a direct lymphatic pathway from tonsil to lung. They have demonstrated in stereoscopic x-rays of many tuberculous chests the presence of a distinct thickening of the pleural covering the extreme apex of the lung which they have termed an apical pleural cap. Various degrees of this pleural thickening can be found ranging from a thin cap with smooth visceral surface to a thick apical pleural with tent shaped projections dipping into the substance of the lung. With extensive involvement of the apices the definition is lost and the cap, massed in the shadows is hidden from view. Such a pathological change in association with a frank pulmonary lesion was easily explained on the grounds of secondary infection of the pleura from within. However, the frequent occurrence of the apical pleural cap in the absence of pulmonary tuberculosis could only be rationally assumed to be the affect of infection from without. With this in mind further study led to the x-ray examination of cases known to have had tuberculous tonsils or glands. While the statistics herein compiled including only 29 cases could scarcely justify any pretentious claims, the association of tonsillar and glandular tuberculosis with pleural and pulmonary involvement is most striking.

If our clinical conclusions justify the assumption of a direct lymphatic pathway from

tonsil to lung, what experimental work have we at hand to substantiate this claim? In this connection the work of Grober is of interest. His experiments included studies on the lymphatic drainage of the tonsils in dogs. Six months following the injection of one tonsil with Chinese ink he demonstrated at autopsy that the dye could be traced into the deep cervical lymphatics, thence directly to the apical pleura and into the parenchyma of the lung where it was seen as a diffuse grayish discoloration of the cellular structure of the apex. In reviewing the work of Grober one is much impressed with the painstaking methods employed. The detailed analysis of autopsies convinces the reader that his claims for the presence of a direct lymphatic route from tonsil to lung are well founded.

CONCLUSIONS.

1. The combined statistics of pathologists show the evidence of tonsillar tuberculosis to be about 4 per cent.

2. Primary tonsillar tuberculosis with surface lesions appear to be exceedingly rare. While the latent type may be either the result of primary or secondary infection, the manifest form presenting local signs and symptoms is usually an evidence of secondary invasion from some other focus in the body.

3. The frequent occurrence of bone, joint and skin tuberculosis favors the theory of hemotogenous metastasis.

4. The generally accepted theory of lymphogenous dissemination from tonsil to hilus and thence by visceral lymphatics to parenchyma of lung does not satisfactorily explain the frequency of apical lesions.

5. The striking association of tonsillar and glandular tuberculosis with an apical pleuritis in the absence of a pulmonary lesion suggests a direct lymphatic drainage from tonsil to pleura. In the light of Grober's experiments and the clinical evidence at hand I believe such an assumption to be well founded.

Lansing, Aug. 2—The ranking of Michigan counties and cities as to safety for babies has brought to the State Health Department many questions about the relative healthfulness of rural and urban districts. Health Commissioner R. M. Olin, gave out today some comparisons which show that last year many rural districts had a higher infant death rate than some large cities. In six counties babies born in larger cities had a better chance to live than in rural and semi-urban parts of the counties. The rates here given are deaths per thousand births in 1919:

Wayne County, Detroit, ---------- 98, rural 121
Jackson County, Jackson, ----------102, rural 102
Alpena County, Alpena, ----------125, rural 172
Gogebic County, Ironwood, ---------105, rural 113
Manistee County, Manistee, ------ 60, rural 94
Grand Traverse, Traverse City, ----65, rural 109

In some other counties the cities had unenviable records compared with surrounding rural districts:

Ingham County, Lansing, ----------130, rural 64
Kent County, Grand Rapids, ------ 84, rural 68
Bay County, Bay City, ----------101, rural 45
Genesee County, Flint, ----------110, rural 88
Delta County, Escanaba, ---------- 97, rural 76
Ishpeming, County, Marquette, ----114, rural 85
Menominee County, Menominee -- 99, rural 81
St. Clair County, Port Huron, ----132, rural 98
Chippewa County, Sault Ste. Marie, 96, rural 76

"Our purpose in issuing these facts," said Commissioner Olin, "is to remind parents and health officers throughout all sections of Michigan that babies can be saved in these most dangerous weeks by steps easily within reach."

Palestine's first medical journal, "Harafooah," (Medicine) has just made its appearance, published by the Jewish Medical Association of Palestine. The journal is a quarterly and its first issue is dedicated to the memory of the Jewish physicians and nurses, who "lay down their lives in the years of upheaval in the Holy Land."

The objects of the medical association, as outlined in the quarterly are to strengthen and coordinate the medical forces of the country and to collaborate with doctors outside Palestine; to give the medical work a national as well as a humane value; to prepare a native soil for Jewish scientists; and to help in the creation of the Hebrew University.

Medical work in Palestine has advanced rapidly during the past two years, stimulated by the American physicians and nurses with the American Zionist Medical Unit, who have taught the native members of the profession, all the latest ideas in medical work and sanitation. Clinics are held by the American doctors, to demonstrate to the Palestine doctors, the most modern methods, and lectures are given at regular intervals.

The hospitals and clinics established by the American Zionist Medical Unit in Palestine, are planned as the beginnings of the Medical College of the Hebrew University at Jerusalem which Prof. Patrick Geddes, noted town planner of the University of Edinburgh, is designing.

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September

Editorials

MEMBERSHIP CAMPAIGN.

Appended hereto is a table revealing the number of members in each county society, the number of non-members and number of non-members eligible for membership. These figures are derived from our records and from reports made by county officers. Twenty county societies have failed to answer *four letters* sent to them requesting data, consequently we cannot complete our survey and show definitely how many eligible non-members there are in the state. On August sixth from the replies received we find that there are 261 physicians who should become members. Of course there must also be some in the twenty counties that have failed to reply to our letters.

The situation resolves itself into two problems:

(a) To wake up twenty county societies and secure replies from them and to cause them to undertake an active campaign to secure the non-members within their boundaries and also to cause them to pursue a plan of society activity.

(b) To secure as members the 261 physicians who have been reported as eligible.

The first problem we intend to attempt to solve by keeping at these twenty non-responsive societies and to secure their co-operative efforts. The counties that fail to respond will be published in our next issue. Surely, a letter on this subject merits a reply. A society that ignores such a request is not represented by efficient officers.

The second problem we hope to solve by having each of the county societies reporting, conduct a personal campaign among these eligible non-members and secure their applications during October. Most of these societies already have a committee at work.

We want to secure, during the month of October, the application of every eligible non-member. If we all join in, devote just a little time, we can put it across. What we desire is 57-100% societies. "So let's get set."

County Societies	No. of Mem.	No. of Non-Mem.	Non-Mem. Eligible for Membership
Alpena	23	2	1
A. C. E.	22	5	5
Barry	18	4	4
Bay	58	10	5
Benzie	8	—	—
Berrien	20	—	—
Branch	16	14	14
Calhoun	101	—	—
Cass	7	—	—
Cheboygan	8	1	1
C. L. M.	24	7	6
Clinton	21	7	7
Delta	19	8	5
Dickinson	11	6	4
Eaton	18	3	3
Genesee	106	12	6
Gogebic	20	8	7
Grand Traverse	22	7	7
Gratiot, Isabella, Clare	30	18	18
Hillsdale	18	—	—
Houghton	45	16	16
Huron	15	—	—
Ionia	13	—	—
Ingham	85	27	25
Jackson	47	—	—
Kalamazoo	118	22	4
Kent	153	—	—
Lapeer	26	4	4
Lenawee	29	—	—
Livingston	6	—	—
Macomb	27	—	—
Manistee	15	7	3
Marquette	40	5	2
Mason	4	—	—
Mecosta	16	0	0
Menominee	9	6	6
Midland	—	—	—
Monroe	21	3	1
Montcalm	16	12	10

Muskegon	55	16	11
Newaygo	10	3	3
Oakland	53	—	—
O. M. C. O. R. O.	10	—	—
Ontonagon	8	2	2
Osceola Lake	4	—	—
Ottawa	31	8	2
Presque Isle	0	7	7
Saginaw	52	29	29
Sanilac	14	12	12
Schoolcraft	7	0	0
Shiawassee	28	11	11
St. Clair	47	—	—
St. Joseph	26	5	5
Tri-County	21	—	—
Tuscola	19	—	—
Washtenaw	89	15	15
Wayne	979	—	—
	2708	322	261

PUBLIC HEALTH ADMINSTRATION.

By Dr. W. A. Evans, Former Health Commissioner, Chicago, Ill.

Four years ago the American Public Health Association very definitely entered on a policy of recognizing state public health societies. Prior to that time they had discussed the subject for years, as had various other health and medical societies. Three years ago they changed their constitution to make the parent organization accord with the plan.

During this period of time they had a committee at work, stimulating the organization of state societies and clearing away obstructions We find that there are about twenty national health societies, with some division of health work as a major activity. The number of state societies in each state ranges from four to fourteen.

Some of these state organizations are fairly active; some have a fair membership, *but most are propaganda organizations with only a nominal membership and officers in name only.* We see great advantage in many directions in federating these societies and obtaining for the united organization a large, strong, popular support.

In the organization of state health societies, this state has assumed leadership. There were state health societies before yours was organized but none is more promising than yours or organized along better lines. Already you have had calls for copies of your constitution and outlines of your plan and others will, no doubt, come to you for advice and counsel.

One of the several functions of a state health society is to serve as a post graduate school for health officers. When you are large enough to divide into sections you will have one division known as, possibly, the section on public health administration. To it, administrative heads will bring their questions and have them discussed by men of experience in administration.

The larger part of the services of health officers in Michigan is administrative in character. In our schools of hygiene, I think we can fairly say laboratory work is given undue prominence—at least so far as the work of the present day health officer is concerned. Of the men in this room, of the health officers in this state, it is true that but a very small part of their time is spent in laboratory work.

It would be very difficult to teach in a school just the qualities needed in an administration. There is, and always will be, a need for a section of a health society which will serve as a post graduate school for health officers. I suggest to your officers that as soon as your size will permit, you organize a section on public health administration and that the discussions in that section be limited to matters which concern administrative health officers. And now permit me to act on the suggestion and get right down to a discussion of some of the problems of the administrative health officer, particularly the county health officers and the town and small city health officer.

There is some evidence that the death rates are higher; there is more typhoid fever; a higher baby death rate and more physical defects among children in the rural than in the urban population. When these statements have been made the people in the rural districts have sometimes denied their truth. In most instances the essayists claiming the rural death rate to be higher, have made their dividing line the city of 10,000, all populations in cities over that being counted as urban, all below that as rural.

To this their antagonists have demurred. They show that the heavier rates in the so-called rural group are in the cities and towns of 1000 to 10,000 and that such populations are not rural. They claim that the line should be drawn at incorporated towns, or towns with a community sewerage and a community water system. They claim that the heaviest rates of the types referred to above are in this group of communities and whichever class they are put into will have the higher rates.

In discussing some of the problems of health officers, I have the officials of this class of communities especially in mind. The duties of a health officer belong under several heads:

1. He is the administrator of the state and local health laws.

2. He is an advisor to the city executive and the city council.

3. He is an inspector, combining the duties of a medical inspector and a sanitary inspector.

4. He is a registrar of vital statistics.

5. He is a laboratory man.

My first suggestion is that he take advantage of his relations to the city council to secure health legislation—just as much as he can foresee any need of, say, in the ensuing five or ten years—and a little bit more. I have in mind that for many activities of health officers he has no legal warrant. The right to do health work is based on the fundamental police power. This is the greatest, most far reaching and most effective of all powers.

In times of great emergency, when people are stirred, health work can be done under police power with great effectiveness and acts of the health officer will be sustained even tho he takes property, destroys property or restrains liberty, and all without law or in the face of law. But except in such times, health work can only be done under the law.

Let me impress upon you the importance of getting ordinances and laws for your every activity. It is your work to draw up the essentials of all such laws, leaving their technical legal points to be covered by the proper official. In some Eastern states the board of health have considerable power to make rulings and ordinances having the same force as those made by other legislative bodies. Not so over most of the country. The rule elsewhere than in the East is that the health board is an administrative body, wholly without legislative authority. They have the right to make rules for internal administration, for the guidance of their employes, but none for control or guidance of the general public. They may decide to enforce within limits, but that is administrative and not legislative.

In most states the legislature or the constitution gives city councils the right to legislate on certain health subjects. Their rights are limited to the powers specifically given them. The health board has no right to legislate except such rights as have been specifically given. Go to the proper legislative bodies with requests for the legislation needed to protect your community.

In this legislation try to keep just a little in advance of public sentiment. If you are too much in advance, your community will not back you up unless you have a forceful personality and a capacity for winning presentation. If you are behind your community sentiment, they lose respect for you. If no more than abreast of it, you fail in your duty.

When you act as an inspector, let me suggest that you make your records on standard forms. The preparation of such forms and blanks might well be one of the functions of this association, acting thru committees. Most of the present health officers have had no academic training. They have been trained by their experiences in their offices or in the army. The reports and records of such health officers will gain immeasurably in value if made on standard forms and blanks. The large city health departments now have blanks and score cards for every kind of inspection. There is not so adequate an equipment for the smaller city health officer. The present score cards would need some changing.

In so far as the health officer acts as a sanitary inspector, he does work as to the value of which there is much controversy. The ablest exponent of what may be called the "Chapin school," Hill, has written a book entitled, "The New Public Health," in which he argues the unimportance of sanitary inspection, and the importance of control of contagion by control of the carriers, principally human carriers.

When Chapin reported a few years ago to the American Medical Association his valuation of the work of the various state health departments, several objected to the conclusions of the report, saying that however it might be in Providence or even in Rhode Island, in their states sanitation was a more important requirement than the report made it appear. It has been many years since Pettenkofer promulgated the theory that disease resulted from filth and that communities could lower their death rates by securing clean water, by sewage disposal, garbage disposal, street and alley cleaning, by household and personal cleanliness.

Later Koch promulgated the theory that disease was due to bacteria and there followed as a development the efforts of cities to limit contagion by control of cases and carriers. As a matter of fact, each theory is supplemental to the other. Unfortunately, however, they are sometimes set against each other. The time will come when the Pettenkofer idea will become so intimately a part of the thought of the community that health officers can disregard them and put all their thought on work under the Koch theory, but that time is not here.

Vaughan says that the standard of performance along this line in the army was high enough. He did not say that of the army of 1898. Our civilian standards are now not far from the level of the army of 1898—probably below them but with less harm resulting because contacts are not as close and the Michigan cli-

mate, bringing the thought home, is not as near tropical as that of the camps of 1898.

You must still act as sanitary inspectors, administrators and guides. With the part time health officer, serving also as a private practitioner of curative medicine, the most difficult work of the health department will be medical inspection. The work of visiting contagion in his own clintele, or the clientele of his competitors; the disputed diagnoses when the disputants feel on a par with the health officer, create impossible situations. Diagnosticans from the state department are of some service, but the only way out is the whole-time health officer.

We should all work to provide the grouping of towns with an organized whole-time department serving the group. In La Salle, Peru and Oslesby they comply with the technical legal requirements by having a nominal health officer in each town. The central health department operates in Peru, for illustration, in the name of the local officer.

When it comes to laboratory service I have this suggestion to make—much laboratory work can be done in the public schools. The pupils in the higher grades can make the dirt test and the Babcock test on milk. It would not require much development to have the high schools make gross bacteriological counts on milk and water and do similar laboratory diagnosis in contagion. In some communities where a joint health department is not feasible, a joint laboratory service could easily be arranged.

I trust when you come together next year a session may be devoted to several problems of the health year. A request for information as to what you are specially interested in would point the way to a program for next year.

There is one subject which you should discuss every year. It is the creation of a public health profession and the fundamental for such a profession is such stability as will come from—

(a) higher pay.

(b) a proper method for the selection of health officers.

(c) greater security in office.

Editor's Note: This paper was read at the Kalamazoo meeting at the meeting arranged for by the section on Public Health. It is such a valuable paper that we are giving it all the prominence possible.

CONSTIPATION.

We desire to draw our readers' attention to the article published in this issue—Intestinal Stasis, written by Dr. Lockwood. In our opinion it is a most timely and practical discussion of a subject that confronts every doctor in the treatment of his patients. Likewise, it is one that receives practically the least careful consideration. The prescription pad or the bottle of cathartic or laxative pills are too handy and it is so easy to say: "Take two on retiring," and let her go at that. For our more fastidious patients of course there is eating of bran, agar-agar, petroleum oils, etc., that are readily prescribed, do some good but we still remain in the dark, so does the patient and our treatment is empiric.

We trust this article will inspire a more careful examination and a more scientific treatment of our constipated patients. May we also request contribution of similar practical and scientific discussion of other conditions that we are too prone to treat in an ineffective routine way?

Editorial Comments

Formerly we were freely confronted by essayists and discussants who, preceded, included or concluded their papers or discussion with the stock phrase "When I was in Germany," or "When I was in London and Edinburg," for the purpose of creating impression and prestige. Now we have a new generation and a new phrase for "impressing introduction"—namely—when I was in the Service" Of the two we believe we all are going to be more tolerant of the latter. We never did worship "Hun Kulture" nor were we ever impressed by those who paid allegiance to Hunisms.

The problem of trained nurses, training courses and availability of trained nurses still remains an acute one. There is no denying of the fact that a trained nurse with the present scarcity in number, let alone the weekly charge now made, is beyond the means of the average home. They simply cannot afford their services. The time is at hand when some provision must be made to meet and solve this problem. In direct bearing upon the subject is a recent comment by Dr. W. J. Mayo, published in the *A. M. A. Journal* and which we reprint herewith:

The arrangement in the Ancon Hospital of an eight-hour schedule for the trained nurse calls attention to the fact that the registered nurse under present conditions is a luxury that cannot be obtained except by the well to do, and this brings up the question: Is the trained nurse a luxury or a necessity? The answer must be that she is a necessity. The high-standard registered nurse is one of the greatest blessings of modern civilization. She has spent three years of twelve months each in training after graduation from high school, thirty-six months in all, the equivalent of a university course of four years of nine months each and in a university the same time

and work would have won for her the degree of Bachelor of Science. The registered trained nurse is not overpaid, considering the character of her training; rather is she underpaid, for she represents the best type of human machine for the care of the sick. But we need other types of nurses less highly trained but nevertheless important social service vehicles, the Fords, so to speak, of the nursing world. If representatives of the nurses' union are approached on the subject of vocational training to develop a large number of young women for this important work they are indignant and call attention to the fact that standards are being raised for physicians, and they ask why they should lower theirs. In this connection it should be remembered that the physician is expected to care for rich and poor alike, and allow no one to suffer for lack of such care, regardless of his ability to pay for service. This is not and can never be the case with the registered trained nurse. A solution of the problem of the training of a sufficient number of nurses is difficult. My sympathies are with the highly trained nurse, and I would be the last one to desire to curtail or reduce the training in any respect; but there are other considerations. Only one of 450 students who enter our public schools graduates from the university. One in ten who graduates from the high schools enters the university, and one in thirty graduates.

There is only the equivalent of the university graduate at the present time in the nursing world, and in the interest of all the people there should be different grades of nurses instead of a dominion of the field by an aristocracy. The time will come, and soon, when there will be the same grades in nursing that there are in other forms of education, for example, common school nurses for the home and family, high school nurses with vocational training, and the university (registered) nurses. The difficulty in carrying out the plan will be in the providing of adequate training for the many young women who may apply for the "common school" course, because the training cannot consist of merely textbook and demonstration courses, but must be the care of the sick in hospitals, the most important part of the preparation. Although the difficulties are many, they are not insuperable. The first six months of the course would be the same for all applicants for various reasons many would stop at the end of this period of probation. Those who drop out at the end of the year would receive a certificate of completion of one year's work. Those who remain for the second year would receive a certificate of completion of two years' work, and those who fulfil the requirements of the three-year course would receive a diploma of graduation. The graduates, who had had preliminary cultural training, after passing suitable examinations at the state university would be granted the degree of Bachelor of Science, as the equivalent of that which is now given for training in medicine, dentistry and other professional branches.

And still the H. C. L. bug thrives with an apparent unsatisfied appetite. The Journal keenly feels the demands of increased cost of everything and our expenses soar each month. Even the daily papers have again increased their price for subscription. If we are to remain above water we must have greater patronage for our advertisers to maintain their business. Once again we urge—patronize them.

Well, here's September again. The kids are back in school, we have had our vacation season and the mosquito bites are about all healed, the campaign workers are warming up and running in second speed and shifting into high, but we "docs" are hitting along in about the same old gait. What are you going to do in your society this fall and winter to arouse renewed interest? It's time for planning and to get under way. Who has a suggestion?

Archives of Surgery Vol. I, No. I, published by the American Medical Association, bi-monthly at an annual subscription of $5.00, made its appearance in July. The editorial board is composed of Dean Lewis, E. Graham, H. Cabot, Thos. Cullen, William Darrach and W. J. Mayo. This new publication will serve as a medium for printing the many valuable articles on surgery that are yearly contributed to the *Journal of the A. M. A.* and for which space is not available. The first issue justifies this new journal by its contents and meets up with the purpose for which it is issued—to establish surgery upon a sounder basis, to enlarge the surgical horizon and to disseminate fundamental facts. It also purposes to comment frequently and freely on the subjects discussed by authors in order that both sides of a mooted question may be placed before the reader and the facts of a writer challenged. In brief, this new publication is a distinct addition to surgical literature. Every surgeon will want to subscribe—he cannot afford to not do so. Its make up is most attractive and characteristic of A. M. A. printing shop excellency. Send your subscription and check to Dr. G. H. Simmons, 535 N. Dearborn St., Chicago—the price $5.00.

The impression is gained from reading various journals and daily papers that a small group of doctors scattered across the country are very much dissatisfied with the law that limits every doctor to one hundred prescription liquor blanks per month. The usual arguments of infringing upon the individual rights of a doctor in directing him what he shall prescribe in the treatment of a patient; the question of the value of liquor as therapeutic agent, and a few others are advanced to substantiate their claims as to why they should not be limited in the number of prescription blanks. It seems, however, that the profession has but one course and that is to comply with the provision of the law. This is our viewpoint. On the other hand we cannot quite conceive of any practice where more than 400 pints of liquor is required in one month. The doctor may well be observed with some suspicion who asserts that he requires more than this amount in his practice. Yes, we have heard of several localities where doctors are giving these subscriptions at $3.00 per, to all comers who complain of catarrh, "colds," tonsilitis and simi-

lar ailments as an excuse. Wouldn't it be well to go a little slow in our demands for removal of restrictions less a skeleton be exposed in a public investigation?

From time to time we have commented upon the necessity of observing certain rules in the preparation of a manuscript for publication. Our comments have without doubt fallen upon sclerosed ears for the effect they have had. Never have we received such a motely array of papers as those read at the Kalamazoo meeting. We believe that at least an author might sign his name to a paper to identify it for then we might more readily appeal to him for aid in decoding them for publication. Oh hum, there are somethings you cannot ever hope to make the other fellow see, so we are about ready to stop trying.

In a recent published communication one person expressed offense because a correspondent in discussing a subject coupled Homeopaths in with osteopaths. We are certain the author did not intend to cast any reflection and the average individual knows that these two schools are not on the same plane—we all hold our homeopaths in highest esteem and the most of them know it.

How about those doctors in your county who are not members? Have you made the effort to secure their application for membership? We want your —every county a hundred per cent. membership society.

Two years ago an average issue of the Journal cost in the neighborhood of $375.00. One year ago it ran about $600.00. Today an average issue costs $875.00, the July issue ran $1,100.00. Do you wonder why we are a bit uneasy about the future cost of issuing The Journal when our expense of publishing is still soaring with no signs of a "nose dive" or a "tail spin." Paper, labor and printer's ink sure demand payment of long prices and to maintain a desired standard we are unable to cut our size or limit our number of articles. The publication committee will hold on for a while longer but a change must come or we are sure to go broke.

The Clinical Surgical Congress will be held in Montreal in October. Preliminary programmes indicate a profitable meeting. This meeting affords an excellent opportunity to become familiar with our Canadian brothers and to learn from their teaching center. Michigan should be well represented.

Just because compulsory health insurance is not occupying front page space we are not justified to assume that its proponents are asleep. The issue is still alive and the profession has need to be alert to counteract political machinations. Have you pledged your local legislative candidates to vote against any such bill?

The Secretary of the Council on Medical Education of the A. M. A. announced the following list of Michigan Hospitals as furnishing acceptable internships:

University of Michigan Homeopathic Hospital.
University Hospital.
City of Detroit Receiving Hospital.
Grace Hospital, Detroit.
Harper Hospital, Detroit.
Henry Ford Hospital, Detroit.
Providence Hospital, Detroit.
St. Mary's Hospital, Detroit.
Butterworth Hospital, Grand Rapids.
Blodgett Memorial Hospital, Grand Rapids.
Hackley Hospital, Muskegon.
Copper Range Hospital, Tri-Mountain.

Finally we got a "nibble" from "Tonic and Sedatives." A poor "nibble" at that and not at all up to the Editor's capability—but we had several hot days that week and Chicago is not a summer resort. Funny, how all embryos like to convey the impression of age and refer back to dates and events that occurred ages before their own neuclei was formed; but then some like to dwell in the dark ages because if they appeared in a modern light their existence wouldn't even cast a shadow. We are pleased to learn that these columns are read by those outside of the state. Say, Fishbine, why don't you print the story about the Interurban and the cow— that's a 1920 quip? We haven't the space.

Correspondence

Michigan State Journal,
Grand Rapids, Michigan.

Dear Doctor:

I was very much interested in your Editorial on our Anti-tuberculosis organizations failing to fully meet present conditions. In this connection I wish to state that some two or three years ago, I brought just that matter before our supervisors, urging them very strongly to erect a tuberculosis sanitorium in Alpena large enough to take care of all the afflicted in this district. A committee was immediately appointed with power to act, but through dissensions among themselves owing to the selection of a site, the thing was dropped. I had a talk with Dr. Van Der Slice, who was holding a clinic here in May last, and told him that I had been quietly working the thing up all of this time.

After this conversation with the doctor, and embibing some of his enthusiasm. I was ready to bring it before our most efficient Board of Commerce. The "Alpena News" very kindly printed my remarks and urged the desirability of such an institution here. A little later Dr. Cabott, of the University of Michigan held a diagnostic clinic in our city, and was very much impressed with the idea of a sanitorium here, also of our making this in some sense a medical center for this portion of Michigan.

I spoke to him about my idea of having a scientific attachment to aid in the diagnosis of all difficult conditions as well as that of the chest. The doctor immediately fell into the plan and later wrote me a letter corroborating what he had stated to me in the presence of one of our most prominent business men. I read the doctor's letter and made some further remarks at

a recent Board of Commerce meeting. A committee of real live men was immediately appointed by the President and things now look rosy for a thoroughly equipped sanitorium in our county at any rate. My idea is, and it will be caried out if legal and possible, to make it an inter-county institution, taking in some five to seven contiguous counties.

I most emphatically agree with you that a place of this kind must be made cheerful, pleasant, instructive and entertaining. You will find, if you look over your old files that I wrote an article in your journal some four or five years ago in which I stated my belief, that tuberculosis cannot be cured without happiness; that the bright star of hope must be kept in the patient's view at all times, or a failure is inevitable. I also said then, what I believe stil, that psychology in the proper sense has a mighty lot to do with the cure of tuberculosis.

I am sorry that you said in your Editorial, and I quote it verbatim, "Today we know that rest, fresh air and nourishing food will accomplish an arresting of the infection if persisted in." Now, Mr. Editor, I don't believe that, I never have believed it, and it will have to be demonstrated to me before I can be made to believe it. I think it a very great evil for our Medical Journals to print such tommy-rot for our lay journals and newspapers to copy, then disseminate among the families of the poor sufferers and I believe that that very thing is the cause of more deaths than can be enumerated. The non-professional don't understand as we do. Rest, fresh air and nourishing food only has a part in the cure of tuberculosis. Therapeutic factors count exactly as much. Without the combination you cannot cure any serious pathological entity. The word arrest seems to be in vogue, instead of cure. Well, in many cases it is correct, in many more it is a misnomer.

I have in my files, cases where competent bacterialogists have pronounced the sputum full of tubercular bascilli, where the temperature ran for a year or more from 90 to 104 degrees; where there was copius expectoration and everything else that goes with typical moderately advanced tuberculosis. Later the same individual was treated. cared for and examined in one of the most noted sanitoriums in America, and was found tuberculous, frequently running a temperature of 100 and over. In recent examinations by expert physical examiners and x-ray pictures, she has been told that there was a question whether there had ever been a tuberculous process in her lungs at all. Again there are very few patients in my experience whose tubercular condition was not preceded by some other disease. I am willing to admit that perhaps we have no remedy (for I have never found one) that will cure tuberculosis per see, but we have numerous remedies that may most markedly aid in the cure of the disease and that lowers the vitality or resistance to such an extent that it became possible for the individual to become infected with tuberculosis by contact, and perhaps there may be those that after all act directly on the lung. Analogy in other ailments, seems to carry out this statement. Another thing we have been taught for a great many years and I never believed it, and have preached otherwise for at least two decades, viz: that tuberculosis was more frequently contracted by metastasis from latent focus than by contact.

I was much taken up by an article in the last number of the Practical Medicine series, published in Chicago. In this number, a Dr. Ward has studied 4,000 cases of contacts and he believes as I have believed all the time, that what is considered to be "The Authorative view is wrong."

In an article by Dr. J. H. Dempster of Detroit, on page 364 of your journal, I find these words: "A working knowledge of physical diagnosis as applied to the chest is most difficult to impart to others, as well as to acquire. It is safe to say that many physicians never become so efficient in the art of percussion and auscultation that their findings reveal the pathology actually present within the theory." I have seldom seen in print two sentences that mean so much to our profession in the examination of the chest. In order to differentiate the different sounds, no matter whether normal or abnormal, it has long been my opinion that one has to have musical ears. I was once walking through the corridor of a large hospital, when I met a thoroughly competent internist carrying a stethescope. I knew him quite well, so I laughingly remarked, "I suppose you have been hearing all kinds of music in the chests of your patients this morning." His reply was, "Well, Doctor, to tell the truth, I'll be d----d if I can hear one quarter of what some of the fellows say they can hear, but I do find that sometimes I can hear things they don't hear." Now that physician was an experienced man and a good chest examiner. Still owing to his modesty, as he expressed himself, he was not quite sure of his ground. A man who can hear three or four different sounds at the same time and read them all, has either a very accurate musical ear or else a vast amount of experience, and comparatively few practitioners have either one, and a large number of our so-called experts have not as much acumen in that direction as many general practitioners.

I was examining the chest of a little child not long ago, percussing both back and front very lightly. The mother stood a number of feet away listening carefully to the very slight taps which I was making on my finger. She was a young woman who had a most thorough musical education on ear training and on the violin; had taken in fact a number of years from some of the greatest masters in America. She caught and differentiated every single note and could tell me the quarters and halves of difference in the musical scale. I was brought up in a musical family myself, and had a good deal of ear training, still she caught slight differences that I could not catch, even after a great many years of percussing chests. I merely make this statement to show how it comes about that the X-ray shows a chest pathology when a physical examination frequently exhibits nothing.

I, like Dr. Dempster: In all humility lay no claim to superiority in the art of diagnosis in the chest conditions as usually taught," but I am quite certain that there are ears and ears, that the good ear can at least equal if not beat the

X-ray; every time; and this is not saying a single word against the X-ray.

I am sorry that I know very little about it, but I do know that I have had rays taken by experts in Michigan, and the chest was found free from both tuberculosis and pleurisy, and within a year the patient died of consumption. It may be possible that while it takes a musical ear or a good ear, if you wish to call it so, as well as good eyes, sensitive fingers, experience and a concentrated interest, to detect abnormalities in the chest and differentiate them. It also takes a good man to read the findings of the X-ray or any other machine.

I think something else too, and feel pretty certain about it, that if there was a greater comingling and loyal co-operation between the country doctors or general practitioners and the university and other big hospital doctors, (who are or should be the scientists in our profession), that there would accrue from this a vast amount of good to the whole profession, as well as to the laity.

I will be dead before I believe that the family doctor is gone or will soon be religated to the dust with the American Indians, the driving horse and——the billy goat.

Deaths

DR. JOHN HENRY CARSTENS.

One of the sad duties that comes to our lot is to record the death of a member, remove

his name from the mailing list and enter the date of death in our membership ledger. This month we were unwillingly compelled to do this for one of our oldest members—one who had been our president and ever a leader in organizational work, and society activity—Dr. John Henry Carstens, of Detroit.

"Dad" Carsten, as he was lovingly termed by most of us, has been summoned from our midst. Regretfully do we resign ourselves to his demise. A man of highest attainments, a leader as well as trail blazer in the specialty he followed, a citizen of loyal trend, a friend of all the profession and teacher of many, revered by all; such is the partial summary of his life. We shall, of course, continue on our way but we will not go as far or as well without Dr. Carstens.

Doctor J. Henry Carstens was born in Kiel, Germany on June 9, 1848 and died in Detroit, August 7, 1920. He came to Detroit with his parents as a small boy. He graduated from the Detroit Medical College in 1870. He began the practice of medicine immediately. For nearly 50 years he has lectured and taught the various branches of medicine and surgery to generations of medical students. At the time of his death he was President of the Detroit College of Medicine and Surgery and Professor of Gynecology at the same institution. He was on the staffs of Harper Hospital and the Woman's Hospital. He was a member of the Wayne County Medical Society (Ex-President), Michigan State Medical Society (Ex-President), American Medical Association, Mississippi Valley Medical Association, American Gynecological Association and American College of Surgeons.

Doctor Carstens took a great deal of interest in city politics and was a candidate for mayor of Detroit on several occasions. He was formerly a member of the Detroit Board of Education and the Detroit Board of Health. For many years Doctor Carstens was an active member of the Harmonie Club and also belonged to the Detroit Athletic Club and the Detroit Club.

He married Miss Hattie Rohnert shortly after he graduated from the Detroit Medical College. He leaves besides his widow the following children: Misses Edith and Mildred Carstens, Mrs. L. J. Hirschman, and Doctor Henry Carstens.

Doctor Carstens was one of the most widely known physicians not only in Michigan but throughout the United States. For many years he was a constant attendant of the American Medical Association, Mississippi Valley Medical Association, Congress on Medical Education and other medical societies. He was a public-spirited, cian and was also city physician.

Doctor Victor Sisung, of Monroe, Michigan, died at his home, Sunday, June 27.

Dr. Sisung was a graduate of the Detroit College of Medicine and Surgery of the class of 1895. After graduating he was associated with St. Mary's Hospital in Detroit as interne for one year, after which he went to Monroe where he had been in practice until about seven months ago when he retired on account of ill health. Doctor Sisung served for eight years as County Physician was also city physician.

Surviving are the widow, three sons, two brothers and one sister.

Doctor H. Beach Morse died very suddenly at his home in Bay City, Monday evening, July 12.

Doctor Morse was born in Brighton, Michigan, in 1872 and was a graduate of the University of Michigan of the class of 1896. After practicing general medicine at Elk Rapids, and specializing for a short time in eye, ear, nose and throat in Lansing, he moved to Bay City.

His widow, one son, his mother, one brother and two sisters survive him.

Doctor L. J. Locy, age 64 years, died at the Goodrich General Hospital, August 16. Doctor Locy had practiced at Davison, Michigan, about thirty years.

State News Notes

For Sale, house with office attached, barn and garage. Value $5,000. No better country and small village practice anywhere in the State, ten grade school, electric lights, two churches, etc., in village of Orleans, Ionia County. Reason for selling, moving out of State. Price $3,000, half down, balance mortgage at 6%. Write Journal for further particulars.

For Sale—Bay City, Michigan. Eye, ear, nose and throat practice and office equipment. Mrs. H. Beach Morse, 1602 9th St., Bay City, Mich.

COLLECTIONS.

Physicians Bills and Hospital Accounts collected anywhere in Michigan. H. C. VanAken. Lawyer, 309 Post Building, Battle Creek, Michigan. Reference any Bank in Battle Creek.

Block for sale—The two-story office and residence block of the late Dr. E. P. Partlow of Constantine, Mich., for sale. Dr. Partlow left a good practice with residence and office well located and in fine condition. Any physician looking for a good location and able to purchase office and residence block write W. F. Thomas, Administrator, Constantine, Mich.

What is reported as the largest medical conference ever assembled in China was held in February of this year. A message from the minister of education of China was read stating China's medical education policy—

1. To establish new medical schools as soon as conditions will allow, one medical school for each province.
2. To improve and extend such schools as are already established.
3. To encourage the study of medicine and to maintain for the scientifically trained doctors a high social status, aiming at a sufficient number for this important profession.
4. To cause to be organized at proper localities such institutions or facilities of investigation as will aid specialists in their research work.
5. To regulate the practice of doctors trained in the traditional way with a view to the unification of standards required of medical practitionals.

For a number of years the University of Wisconsin has been giving the two year medical course. Recently this University has obtained authority to offer a complete four year medical course. It is reported that the teaching of the third year will begin in fall of 1923 and that of the fourth year in the fall of 1924. The Act provides also for the establishing a State Hospital at Madison. This new hospital together with the University Infirmary and the Bradley Memorial Hospital will furnish the ncssary beds for teaching.

The Trustees of the University of Alabama have ordered the removal of the Medical School from Mobile to Tuscaloosa, as this school failed to obtain a class A rating with the Council on Medical Education of the American Medical Association. The University is establishing what will be practically a new medical school. During 1920-1921 only the work of the freshman year will be given and in the following session two years work will be given. The clinical courses will not be offered until such time as the University feels that they can be established on a high plane.

The Huron Milling Company of Harbor Beach, Michigan, is erecting a new Hospital for community use. This is one part of the welfare work being done by this company, for Harbor Beach. The company is just completing a community house at a cost of almost $100,000, which with a municipal bathing beach and a public park and the new hospital will be presented to the city. The hospital will be modern in every particular and will be under the direction of Dr. Bache Van Nuys who resigns a position with the Victoria Copper Co. to accept this position.

Doctor William G. Wander, M.D., Washington University, will be asociated with Doctor H. R.

Varney, of Detroit, after October 1, 1920. Doctor Wander was formerly head of the resident service of the Barnard Skin and Cancer Hospital of St. Louis.

Doctor Frank B. Walker of Detroit is Chairman of Committee of Arrangements for the first convention of the "Officers of the Great War" to be held in Detroit, September 7, 8, 9, 1920. Doctor Walker was authorized to appoint the chairman and members of the sub-committees.

The General Educational Board of the Rockefeller Institute has announced the gift of $5,000,000 to Rochester University to be used in connection with a second $5,000,000 given by Mr. George Eastman for the founding of a school of medicine and dentistry.

Doctor David Inglis, Ex. President of the Michigan State Medical Society, and for many years one of the leading alienists in this state, has retired from the practice of medicine. He has bought a home in Ann Arbor and will spend his winters in the South.

Doctor Willard L. Brennell, formerly of Roxbury, Mass., has been appointed Superintendent of the new Highland Park Municipal Hospital. Doctor Brennell will take charge October 1, 1920.

Doctor William F. Coburn, of Casey, Illinois, has purchased the residence and practice of Doctor J. M. Blackman at Quincy, Michigan.

County Society News

GRATIOT-ISABELLA-CLARE COUNTY.

The Gratiot-Isabella-Clare County Society met at Brainerd Hospital in Alma, Aug. 12.

Dr. A. O. Hart, of St. Johns, was the out of town guest, and read a paper on "Group Medicine, Its Advantage, and Disadvantage."

This paper was discussed by nearly every one present.

For a clinic Drs. Brainerd, Barstow and DuBois showed several interesting cases of fractures and other surgical conditions.

E. M. Highfield, Secretary.

Book Reviews

THE NEWER METHODS OF BLOOD AND URINE CHEMISTRY: By R. B. H. Gradwohl, M.D., and A. J. Blaivas. 2nd Edition. C. V. Mosby Company, St. Louis. Price $5.00.

A second edition of this already valuable and reliable reference book has been necessitated by the recent development of new facts in technic and interpretation of blood and urine chemistry. These facts have been incorporated into the present volume with the result that a much larger and more valuable book has resulted. A book such as this should assist in many ways towards developing an interest in a more complete study of the blood and urine by practical physicians of today.

DISEASES OF CHILDREN. By John L. Morse, A.M., M.D., Harvard Medical School Professor of Pediatrics. W. M. Leonard, Boston. Price $7.50

This discussion presents two hundred histories of actual patients selected to illustrate the diagnosis, prognosis and treatment of the diseases of infancy and childhood. There is also included an introductory section on the normal development and physical examination of infants and children.

As outlined it presents many helpful suggestions and is an ever handy and reliable consultant. We feel inclined to commend highly and at the same time to express the hope that our readers will avail themselves of the help that will be secured from the study of this text.

HUMAN PARASITOLOGY, with Notes on Bacteriology, Mycology, Laboratory Diagnosis, Hematology and Serology, by Damaso Rivas, M.D., Ph.D., Assistant Director of the Course in Tropical Medicine. University of Pennsylvania, Octavo Volume of 715 pages with 422 illustrations and 18 plates most of which are in colors. Philadelphia and London: W. B. Saunders Company, 1920. Cloth, $8.00 net.

The author has succeeded in writing a very pleasing and scientific discussion of his subject. It is a subject of vital importance to students, physicians, health officers, certain business interests and communities. The work is based upon the author's twenty years of investigation and study.

DIAGNOSIS AND TREATMENT OF BRAIN INJURIES. William Sharpe, M.D., Professor Neurological Surgery, New York Policlinic. Cloth, 757 pp., 232 illustrations. J. B. Lippincott & Co., Philadelphia.

This is the most complete discussion of injuries to the brain, their diagnosis and treatment that has come to our attention. Further, it is such a practical and understandable presentation that it is a most interest absorbing treatise. The author further amplifies the text by excellent case histories, which emphasize the points discussed. Part III deals with brain injuries of newborn babies and children.

In the first part there is a most comprehensive discussion of pathology, diagnosis and treatment. In the light of this presentation, which records the modern viewpoint of those of broad experience, there exists no reason for clinging to the theories and traditions of the past in dealing with skull and brain injuries. It is demonstrable that a goodly number of these cases will recover when accorded proper treatment. Many there are who cling to firmly to a palliative attitude; likewise many become at once pessimistic when such a brain case is encountered. In order that these extremes may become less in number, we urge a wide securance and study of this text. We are greatly impressed with its merit.